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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS



THE FEDERAL SUBSIDY IN LAND RECLAMATION

R. P. TEELE

SOME MEASURES AND MEASUREMENTS OF
TELEPHONE UTILITY TAXATION

HERBERT B. DORAU AND MARJORIE ALEXANDER

INTERMOUNTAIN AGRICULTURE AND PACIFIC
COAST POPULATIONS

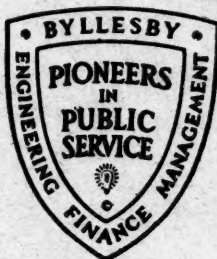
W. E. LEONARD

INDEX NUMBERS OF PUBLIC UTILITY
CONSTRUCTION COSTS

PAUL JEROME RAVER

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THE FEDERAL SUBSIDY IN LAND RECLAMATION

BY R. P. TEELE*

EDITORIAL FOREWORD

THIS article by the late Mr. Teele raises a fundamental problem in the development of a scientific agricultural policy for the future. Shall we continue to subsidize the private development of agricultural land when, as a result of influences too numerous to recount here, we have too many farms and farmers for profitable operation? In the interest of a balanced agriculture, should we not discourage, rather than stimulate, putting more land into agricultural use?

Mr. Teele analyzes this problem with reference to one class of land and one type of subsidy. But subsidies take various forms, and we must consider more than one type of land. The task of fitting American agriculture into our national and world economy so as to promote the considered welfare of all is many-sided. In the past, our general

policy has been to offer many inducements to accelerate agricultural development. We have had overproduction in the past. However, new after-war conditions require new policies. For many years the present writer has urged a thorough, impartial examination of past policies and present conditions with a view to formulating a comprehensive national agricultural policy for the future. The present condition of agriculture and the confusion of counsels make this task more urgent than before. It requires statesmanship of the highest order and a scientific spirit.

In view of the studies thus far made, it seems reasonable to suggest that we reverse our former policies. Instead of removing obstacles to or actively promoting agricultural expansion, should we not apply the brakes to this movement? Instead of intensifying competition by bringing more land into use, should we not seek ways of taking land out

* *Editorial Note:* Ray Palmer Teele, economist of the United States Department of Agriculture, died suddenly on August 31, 1927, at Myton, Utah, while engaged in a special investigation of reclamation projects on Indian reservations for the Department of the Interior. Teele was born in Fillmore County, Minnesota. He was educated at the University of

Nebraska, from which he received the degree of M.A. in 1899. From 1899 to 1919 and from 1921 until his death, he had been connected with the United States Department of Agriculture. He also had charge of the irrigation and drainage census in the Bureau of the Census in 1910 and again in 1920.

Teele was a pioneer in the field of irrigation eco-

of agricultural use and thus limiting competition? The exact rôle of public agencies in working toward this general aim offers many difficulties, but they are questions of means rather than ends. The economic and social consequences of any particular form of public action are the limiting factors at the present time. Mr. Teele directs attention to this phase of the problem in so far as it relates to the reclamation of arid land with government aid.

Mr. Teele was solicited for this manuscript

after he had discussed in an earlier *Journal* (October, 1926) the financing of irrigation projects under private auspices. Because of his untimely death, the manuscript was not put into final form. Nevertheless, the editors decided to print the article without substantial change, merely adding more recent figures where available. It is obvious that under these circumstances the article should not be regarded as an official statement of the Department of Agriculture.

RICHARD T. ELY

FOR three quarters of a century the land policy of the federal government, with one exception, has been to encourage the development of its unused lands merely to the extent of removing all obstacles to private initiative. Under the acts of 1849, 1850, and 1860, the federally owned swamp lands were granted to the states in which they were situated in order that the states might provide for their reclamation; under the Homestead Act of 1862, limited areas of public land can be acquired by residence thereon; under the Act of 1866, the federal government recognized the right of the states to control irrigation development within their borders, and granted rights of way over public lands for irrigation ditching; under the Desert Land Act of 1877, the government enlarged the area of land in arid regions that might be taken

by an individual, with a view to encouraging the reclamation of such land; under the Carey Act of 1894, the government granted areas of arid public land to the states in which they were situated on condition that the states provide for their reclamation; and under the Act of 1916 it provided for the inclusion of public lands within the boundaries of irrigation districts organized under state laws. Every one of these laws had for its purpose, as was said, merely the removal of obstacles to expansion under private initiative.

The single exception to this well established and long continued policy is the United States Reclamation Act of 1902, which provides for government construction of irrigation works, with a subsidy to irrigation development under a provision that the users of the waters supplied shall repay the cost of con-

(Editorial Note continued from page 337)

nomics and one of the foremost authorities on that subject. He had written two books which are standard works on the subject besides a large number of articles and bulletins dealing with irrigation and drainage economics. Some of his writings have been translated into foreign languages for use by foreign governments. His latest book is just off the press of the A. W. Shaw Company, of Chicago. His work for 26 years in the Department of Agriculture was characterized by painstaking study of the facts coupled with keen insight in their interpretation.

The editors also take this occasion to record the death of another valued worker in the Depart-

ment of Agriculture, whose writing has appeared in the *Journal*. Bertha Henderson, assistant economic analyst, died June 27, 1927, at Fairbury, Nebraska, while she was endeavoring to finish a bulletin on state policies of selling and settling vacant lands. After studying at the University of Chicago and at Columbia University and teaching for several years, Miss Henderson came to the Bureau of Agricultural Economics in 1919. Since 1922 she has devoted particular attention to land settlement problems. Her article, "State Policies in Agricultural Settlement," appeared in the July, 1926, issue of the *Journal*.

struction in installments. Interest on capital during the development period is not considered as part of cost; the beginning of repayments is postponed for varying periods; and no interest is charged on deferred payments.¹

The situation with reference to the acreage irrigated in 1919 is shown in Table I, based on Census data.

Extent and Nature of Subsidy

The extent of the subsidy to irrigation reclamation, from the standpoint of the cost to the government, assuming that the average rate of interest paid by the United States on its borrowings is 4%, is presented in Table II. This shows the reported net investment and interest at 4% on the net investment reported from year to year, compounded annually. The basic figures are taken from the annual reports of the United States Reclamation Service.

To 1922, the subsidy exceeded \$70,000,000. The amount of the subsidy will continually increase even if payments in accordance with the law were to begin at once and not be interrupted, since the payments required will at no time equal the interest on the present investment of the United States in these

¹ The Acts of 1924, 1925 and 1926 affecting irrigation were merely modifications of the general policy laid down in the Act of 1902. The Act of 1924 provided for a survey of old projects as a basis for legislation for writing off a part of the construction cost of these projects, for a classification of the lands in the old projects as a basis for fixing rates of repayment of the construction cost on the annual returns from the land, for the inclusion of all arrears on construction repayments and charges for operation and maintenance in a new construction charge to be repaid on the new basis, and for the selection of settlers. The Act of 1925 carried provisions for several new projects and in these it required that the states in which the proposed projects are situated provide for the financing of settlers as a condition of the construction of the projects. These provisos were objected to but accepted in order to get the appropriations through. However, in the Act of 1926 these conditions had shrunk to

TABLE I. ACREAGE IRRIGATED IN 1919 UNDER PRIVATE INITIATIVE AND UNDER THE UNITED STATES RECLAMATION ACT

| | Acres Irrigated in 1919 | Percentage of Total |
|---|-------------------------------|---------------------------|
| Private initiative | 17,652,596 | 92.0% |
| United States Reclamation Act | 1,254,569 | 6.5 |
| On United States Indian projects | 284,551 | 1.5 |
| Total | 19,191,716 | 100.0 |

projects, including interest.² The subsidy to June 30, 1922 exceeded \$50 for each acre irrigated on the government projects in that year.

It should be noted that this is not a subsidy to agriculture generally or even to irrigated agriculture generally, but

TABLE II. COST OF UNITED STATES RECLAMATION WORK TO JUNE 30, 1922*

| | |
|--|---------------|
| Reported debits | \$171,496,409 |
| Reported credits | 41,350,449 |
| Reported net investment | 130,145,960† |
| Interest on annual net investment at 4% compounded annually | 70,694,987 |
| Total cost to the government | \$200,840,947 |

* Twenty-first Annual Report of the Bureau of Reclamation, p. 39.

† Corresponding figures of net investment in 1926 are given in the Twenty-fifth Annual Report of the Bureau of Reclamation as follows (p. 120): Reported debits, \$214,126,532; reported credits, \$66,848,012; net investment, \$147,278,520.

one giving the Secretary of the Interior permission "in his discretion" to make agreements with states for cooperation in promoting settlements. The Act of 1925 also provided for an average repayment period of 74 years on new projects, but the Act of 1926 placed an upper limit of 40 years for these repayments. Other details of these recent acts are noted later in this article.

² By Act of Congress, May 25, 1926, the Reclamation Service was authorized to write off \$14,254,797 as definitely lost on account of uncollectible arrears in repayment of costs. In addition, charges in the amount of \$12,788,406 were "suspended" and classed as "probable loss." Those two items total \$27,043,203. The "definite" loss, therefore, is about 9%, and the "probable" loss about 8%, of the construction cost (\$160,176,415.20) as given by the Bureau of Reclamation up to the close of the fiscal year ending June 30, 1925.

to about one acre in 765 of the land in farms in the United States as a whole,³ and to about one acre in 15 of the land irrigated under both public and private agencies.⁴ It is not a subsidy to agriculture, but to the individuals who are farming those particular lands, and in so far as it affects agriculture generally it depresses agriculture by adding to the volume of production without a corresponding increase in demand.

The figures just given are based on the financial record of our government reclamation work as a whole. The subsidy is not evenly spread over the lands in the government projects. On some projects, payments have begun as soon as water was supplied; on others, the beginning of payments has been postponed many years, the maximum period of postponement being 14 years. On one project for which payment was postponed for 14 years, the announced charge for water is \$90 an acre (Rio Grande Project).⁵ The farmer who has been on this project from the beginning has had the use of a \$90 investment per acre of his farm for 14 years without charge. If he were charged interest at 6%, the bill would amount, at the time he began payment, to \$192 an acre, and at the end of the 20-year period during which under the law he will pay the \$90 without interest, he would still owe the government \$465 an acre. As compared with the farmer who pays 6% interest on borrowed money, the

subsidy to the farmer on the project mentioned equals \$465 an acre. According to the Census of 1920, the average value of land in farms in this project was about \$113 an acre, and the amount of the subsidy to a farmer who has been there from the time water was first supplied is therefore more than four times the 1920 average value of the land in the project.

This is an extreme case. The period of postponement of the beginning of payments from the time water was first supplied varies from nothing to 14 years. The percentage of the original charge remaining unpaid at the end of the 20-year period of repayment, when interest at 6% is included, varies from 135.6% when there is no postponement to 517.1% when the beginning is postponed 14 years.

The average period of postponement, on projects for which the date of beginning has been announced, giving the projects weight in the average in proportion to their net cost, has been about 6 years.⁶ Consequently, the average indebtedness to the government at the end of the 20-year period of repayment, when the debt is considered discharged, including a 6% interest charge, will be 263% of the average announced charge.

The average capital invested in United States Reclamation enterprises per acre of land to which water could be supplied in 1920 was about \$65, according to the Fourteenth Census.⁷ On

³ The proportion is 1,250,000 acres irrigated in United States Reclamation projects to 955,883,715 acres in all farms, according to the 1920 Census. Taking the results of the 1925 Agricultural Census, the proportion would be 1,302,300 acres irrigated on government projects to 924,319,352 acres in farms. This would mean a subsidy to about one acre in 700.

⁴ The proportion is 1,250,000 acres irrigated on United States Reclamation projects, to 19,191,716 acres in total area irrigated by both public and private agencies.

⁵ This does not take account of an extension of the period of repayment under the Act of December 5, 1924, which, for the Rio Grande project, is estimated at 39 years. See R. P. Teele, *The Economics of Land Reclamation in the United States* (A. W. Shaw Co., Chicago, 1927), p. 80.

⁶ Recent legislation in 1925 and 1926 has resulted in extending the periods of repayment, thus in effect increasing the amount of the subsidy (see footnote 1).

⁷ Vol. VII, p. 32.

this basis, with a charge of interest at 6% on deferred payments, the average subsidy to water users who received water as soon as the government was prepared to supply it will be \$170 an acre at the time when their obligations are considered discharged. The Census shows an average value of land in farms receiving water from United States Reclamation projects of \$120 an acre; the maximum subsidy is more than one and one-third times the average value of the land.

Subsidy Not Justified by Present Conditions

The government is under contract with the owners of lands now supplied with water by it, and must fulfil its contracts, but there can be no justification for subsidizing the reclamation of *additional* land under present conditions. If at any time in the future it becomes necessary to subsidize agricultural production, the subsidy should take a form that will help agriculture generally, and the aid should not be confined to the owners of submarginal lands that otherwise would not be cultivated. This policy seems wise when we consider only the present status and rate of irrigation development, aside from economic conditions in agriculture generally.

The *Report of the Census of 1920*⁸ showed an area of 6,828,761 acres in public and private projects for which water was ready in 1920 but which was not irrigated in 1919, and an area of 16,699,105 acres in irrigation enterprises in 1920 that were not yet irrigated in 1919. The increase in the area irrigated

in the United States between 1909 and 1919 was 475,843 acres. At this rate of increase, the area for which water was ready in 1920 that was not irrigated in 1919 will take care of the increase for 14 years, and the area in enterprises in excess of that irrigated in 1919 will take care of the excess for 35 years.

Census figures show, however, that the rate of increase in area irrigated is declining. The average annual increase in area irrigated between 1909 and 1919—475,843 acres—is but 71% of the average annual increase between 1899 and 1909—668,882 acres. Annual figures are not available except for the United States Reclamation projects. The increases in the area irrigated by that service from 1913 to 1925 are given in Table III.

It will be noted that the annual increase dropped from about 108,000 acres in 1916 to about 2,000 in 1921. In 1922 there was an actual decrease, according to official records, with a partial recovery in 1923 and a great spurt in 1924.⁹ Throughout this period the

TABLE III. ANNUAL INCREASE IN AREA IRRIGATED IN UNITED STATES RECLAMATION SERVICE PROJECTS, 1913 TO 1925*

| Year | Area Irrigated (acres) | Increase over Preceding Year (acres) |
|-----------|------------------------|--------------------------------------|
| 1913..... | 694,142 | ..... |
| 1914..... | 761,271 | 67,229 |
| 1915..... | 814,906 | 53,635 |
| 1916..... | 922,821 | 107,915 |
| 1917..... | 1,026,663 | 103,842 |
| 1918..... | 1,119,566 | 92,903 |
| 1919..... | 1,187,255 | 67,659 |
| 1920..... | 1,225,480 | 38,255 |
| 1921..... | 1,227,500 | 2,020 |
| 1922..... | 1,202,130 | -25,370† |
| 1923..... | 1,213,700 | 11,570 |
| 1924..... | 1,290,890 | 77,190 |
| 1925..... | 1,320,300 | 29,410 |

* Twenty-third *Annual Report*, Bureau of Reclamation, p. 194; Twenty-fourth *Annual Report*, p. 174; Twenty-fifth *Annual Report*, p. 152.

† Decrease.

⁸ Vol. VII, p. 41.

⁹ The extension of the period of repayment and a new method of estimating and assessing the costs of projects on settlers gave impetus to some new projects that otherwise would not have been considered feasible.

unirrigated area for which water was available was nearly half a million acres, showing that lack of expansion did not result from lack of land ready for use. It is known also that the experience of the government projects is typical of that on reclamation projects generally, although actual figures are not available.

No doubt the very marked decline in the rate of increase in acreage irrigated in the few years just past is largely due to the general depression in agriculture. But the Census figures indicate that the rate of expansion began to decline long before the present depression, while the Reclamation Service data show an increasingly rapid decline during the boom years from 1916 to 1921.

The explanation of this long-time decline is the increasing cost of reclamation work. The Census figures show a great increase in the average cost per acre for irrigation works between 1910 and 1920 (Table IV).

The figures in Table IV do not correctly represent the cost of new construction in each decade. The correct

TABLE IV. AVERAGE COST PER ACRE FOR IRRIGATION WORKS*

| Year | Average Cost Per Acre | Percentage Increase over Preceding Census Year | Percentage Increase over Average for 1890 |
|------|-----------------------|--|---|
| 1890 | \$7.96 | ..... | ..... |
| 1900 | 9.04 | 13.6% | 13.6% |
| 1910 | 15.85 | 75.3 | 99.1 |
| 1920 | 26.81 | 69.1 | 236.8 |

* Fourteenth Census of United States, Vol. VII, p. 21.

TABLE V. AVERAGE COST PER ACRE FOR IRRIGATION WORKS FOR LAND BROUGHT UNDER IRRIGATION IN EACH DECADE COVERED BY THE CENSUS

| Year | Average Cost per Acre for Increased Area | Percentage Increase over Preceding Decade | Percentage Increase over 1890 |
|------|--|---|-------------------------------|
| 1890 | \$ 7.96* | ..... | ..... |
| 1900 | 10.04 | 26.1% | 26.1% |
| 1910 | 20.05 | 99.7 | 151.9 |
| 1920 | 65.50 | 226.7 | 722.9 |

* Average for all development up to 1890.

showing for increased cost is obtained by basing averages on increased acreage and increased cost. Such averages are given in Table V.

The Census report for 1920 shows a total area in drainage enterprises which is 23,755,129 acres in excess of the improved area in the same enterprises. There was no previous census of drainage and, consequently, no rate of extension of the area of drained land put into use can be determined.

Taking irrigation and drainage together, there was in 1920 an area of more than 40,000,000 acres for which reclamation works had been built or were being built that had not been put into cultivation. It is clear that a considerable further expansion of our agriculture on reclaimed land is possible without resorting to a continued government subsidy with respect to additional lands.¹⁰

¹⁰ The general grounds for justifying the subsidy of reclaimed land are discussed and criticized by the writer in his previously cited book, *The Economics of Land Reclamation in the United States*, pp. 317-322.

INDEX NUMBERS OF PUBLIC UTILITY CONSTRUCTION COSTS

By PAUL JEROME RAVER

IN the controversy over the question of the proper basis for public utility valuations, one of the principal objections raised against the use of reproduction cost has been that it requires redetermination at comparatively short intervals with great expenditure of time and money. Index numbers of public utility construction costs have been developed which attempt a summary expression of the general trend of prices. Although some refinement of these indexes has been attempted by weighting the component items, little attention has been given to the possibilities of developing a definite yardstick which will measure changes in the cost of particular parts of a property with that degree of refinement which is commensurate with the ordinary engineering valuation.

The use of the index number is not proposed as an argument in favor of the reproduction cost theory of valuation, but as a device for overcoming some of the objections which are raised against that theory—objections which may be sound but are nevertheless futile from a practical standpoint as long as the courts uphold the theory. The efficiency of the public utility industry has been increasing, coupled with a larger supply of money and low interest rates. These tendencies have created an increment of value in favor of the reproduction valuation. Utilities, therefore, hesitate to accept investment as a basis for value though realizing that the time may not be far off when the investment basis will yield a greater return than

reproduction cost. With the possibility that prices may have a downward trend in the future, index numbers of construction costs take their place as an important device for indicating the point where investment overtakes cost of reproduction. Increased labor productivity and advances in the art may have a greater effect in bringing these two bases into coincidence than falling prices will have. It is unlikely, however, that the Supreme Court will alter its position regarding reproduction cost until it is generally recognized that the adoption of the investment standard requires changing the rate of return in accordance with changes in the purchasing power of the dollar.

This procedure is sometimes cited by proponents of the investment theory as a simple solution of the valuation problem. Unfortunately for the assumed simplicity of the case, money incomes and prices do not move together. The purchasing power of the dollar may be decreasing at a slower rate than increasing prices would indicate. For example, large-scale production and advances in the art of electrical generation have resulted in marked reductions in unit construction as well as unit production costs. In some cases this decrease in construction costs resulting from increased efficiency is measurable. Where it is measurable, the index number is an accurate barometer of the purchasing power of the construction dollar. As long as the argument for changing the rate of return to correspond with changes in the purchasing power of the

dollar is confined to construction costs, the index number serves admirably for the determination and expression of that purchasing power. Variable labor productivity, while not so easily analyzed as fluctuating prices, is an important consideration in the computation of index numbers and considerable attention has been given to that factor in this study.

*Confidence Which Index Numbers
Merit as Measures of Price
Fluctuations*

The accuracy with which an index number represents the variable tendencies of a series of fluctuating prices depends upon the accuracy and completeness of the information available for computing and weighting those tendencies. Many index numbers do not measure up to this criterion. Indeed, much of the distrust of index numbers has been due to the fact that too much has been expected of them. This criticism applies particularly to "general purpose" indexes, when applied to special

purposes for which they were not designed. The field of application has been so broad in extent that attempts to apply the index to particular cases yield inaccurate results.

By narrowing the field of application, confining the index to a particular business in a particular location, its accuracy is increased. It is no longer a "general purpose" index. The selection of the significant commodities, the weighting of the materials, the compilation of the prices and fixing of the base period can all be predicated upon a system which is accurate for the conditions and special purposes peculiar to that business.

Index Numbers of Street Railway Construction Costs

The street railway industry lends itself particularly well to the making of such an index number because the construction side of the industry has been fairly well stabilized for a number of years. In order to illustrate the methodology, a group of street railway properties was selected whose records were available for study. For purposes of simplicity a large sample of straight-track construction was analyzed.

*Selecting the Significant Types of
Construction*

A selection of significant track types and mileages was made in 1926 for the group of companies considered, and it was found that this weight could be held as a constant back to 1913 without any material distortion of the index on account of extensions and abandonments. It should be recognized that if the sample is correctly chosen, extensions will have only a small effect on the index number of costs because the

TABLE I. ITEMS CONSIDERED IN COMPILING INDEX NUMBER OF COST OF TRACK CONSTRUCTION

| 1. ITEMS INCLUDED | 2. ITEMS EXCLUDED |
|----------------------------|--|
| Ties—wood | Bank sand |
| Tie rods | Sewer brick |
| Tie plates | Acetylene |
| Special rail fastenings | Asphaltum paving cement |
| Torpedo sand | Boat spikes |
| Crushed stone | Track bolts |
| Portland cement | Coal |
| Rail | Calcium chloride |
| Hook-head spikes | Elastite expansion joints |
| Granite blocks (paving) | Fetter drive screws |
| Vitrified brick (paving) | Kerosene oil |
| Creosoted blocks (paving) | Slag |
| Fish plates | Steel ties |
| Hauling excavated material | Top dressing |
| Direct labor charges | Tools, machines, power, power equipment, and so on |
| | All overhead charges |

constituent parts of the extensions will fluctuate in the same proportion as the sample. Where the extensions are all of one type, this error, if there is one, will be cumulative and will eventually require a recasting of weights. If the extensions are not all of one type, the errors may be found to be compensating. Also, in the case of a large expansion program involving radical changes in track design, the weight of track miles and types may have to be recast. A recasting of this weight involves the recomputation of all the quantities of material.

In the present study, approximately 95% of the total revenue track on streets was considered a fair sample and the various types of track construction were taken in approximately the same proportion. A sample one-tenth as large would give an index of equal accuracy provided all parts of the sample were reduced in the same proportion. However, the probable error from improper proportioning is reduced as the sample approaches 100%. The sample includes various types of construction from low tee rail open track to 9-inch girder rail paved track. Of the total sample approximately 93% is paved and concreted construction. The principal paving material is granite block, with creosoted block, brick, and

concrete making up the balance in varying proportions. A complete and accurate chainage record and paving records were available so that the selection of the types and determination of the quantities of material in each type were comparatively simple. No field work was necessary. Most utilities today have either an accurate chainage record of their own or a detailed inventory of their property from some previous valuation which can be used as a basis for an index number.

Selecting the Significant Construction Materials

In Table I are listed the items of material considered in compiling this index number of track construction costs. In making up the list, the relative importance of the materials in the track structure was first considered. Where a particular kind of material was significant in one type of track construction but not in another type, the relative significance of the two types of track construction in the whole sample was the factor determining whether or not the material should be included in the index number. For example, calcium chloride and elastite expansion joints together constitute only about 1% of the cost of material for track with con-

TABLE II. RELATIVE PRICES OF TRACK MATERIALS
Contract Prices, Delivered to Yard—1913=100%

| Classification | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 |
|-------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|
| Rail—high tee and girder..... | 100.0 | 100.0 | 100.0 | 121.8† | 150.9† | 198.2† | 169.5† | 169.5† | 156.7 | 154.4 | 142.7 | 147.9 | 147.9 | 147.9 |
| Rail—low tee..... | 100.0 | 107.2 | 106.5 | 107.7 | 123.1† | 205.7 | 157.3 | 152.4 | 137.5† | 132.6 | 139.5 | 132.3 | 141.5 | 140.4 |
| Fish plates..... | 100.0 | 100.0 | 100.0 | 114.5 | 128.2 | 199.1 | 270.0 | 270.0 | 237.2 | 187.8 | 251.0 | 258.9 | 258.9 | 258.9 |
| Tie rods..... | 100.0 | 100.0 | 102.1 | 114.6 | 125.0 | 131.2 | 133.6 | 157.6 | 119.8 | 79.2 | 114.6 | 100.3 | 105.9 | 93.7 |
| Tie plates..... | 100.0 | 87.2 | 74.7 | 182.5 | 245.2 | 245.2 | 259.3 | 203.6 | 218.1 | 187.5 | 197.9 | 197.9 | 205.3 | 205.3 |
| Special rail fastenings..... | 100.0 | 100.0 | 103.1 | 146.9 | 203.1 | 257.2 | 226.3 | 304.4 | 206.3 | 156.2 | 196.3 | 188.8 | 181.2 | 181.2 |
| Hook-head spikes..... | 100.0 | 97.9 | 93.1 | 111.8 | 122.7 | 122.7 | 195.1† | 264.9 | 156.7 | 186.3 | 221.4 | 197.6 | 209.9 | 216.6 |
| Ties..... | 100.0 | 99.1 | 100.0 | 85.5 | 95.4 | 110.9 | 113.6 | 167.3 | 196.4 | 146.9 | 156.8 | 136.4 | 136.4 | 136.4 |
| Torpedo sand..... | 100.0 | 114.1 | 114.1 | 92.4 | 114.1 | 144.6 | 130.4 | 239.1 | 255.4 | 244.6 | 217.4 | 211.9 | 188.0 | 179.3 |
| Crushed stone..... | 100.0 | 100.0 | 102.0 | 131.0 | 146.0 | 171.0 | 190.0 | 200.0 | 151.0 | 194.0 | 211.0 | 210.0 | 205.0 | 195.0 |
| Portland cement..... | 100.0 | 98.0 | 98.0 | 102.9 | 110.3 | 110.3 | 120.1 | 139.7 | 159.3 | 159.3 | 162.7 | 164.4 | 164.4 | 164.4 |
| Granite paving blocks..... | 100.0 | 100.0 | 100.0 | 124.7† | 146.4† | 171.1† | 190.1† | 182.5 | 174.9 | 171.1 | 163.5 | 147.3 | 143.5 | 143.5 |
| Vitrified brick, paving..... | 100.0 | 100.0 | 107.3 | 115.3 | 149.3 | 169.3 | 236.0 | 165.3 | 172.0 | 172.0 | 165.3 | 165.3 | 165.3 | 168.3 |
| Creosoted wood blocks..... | 100.0 | 112.3 | 107.7 | 129.2 | 140.2 | 230.8 | 230.8 | 461.5 | 369.2 | 430.8 | 430.8 | 476.9 | 476.9 | 476.9 |
| Hauling excavated material* | 100.0 | 112.3 | 107.7 | 129.2 | 140.2 | 230.8 | 230.8 | 461.5 | 369.2 | 430.8 | 430.8 | 476.9 | 476.9 | 476.9 |

* Yearly contract.

† None purchased; market price used.

crete paving, and of the total sample only about 1.1% is track with concrete paving. Hence these two items of material are not significant in the index number. On the other hand, hook-head spikes represent only about 0.6% of the total cost of material for track types using hook-head spikes, but 6.73% of the total sample is track using hook-head spikes and the item is significant. The final factor influencing the selection of items which are on the border line, so to speak, is the effect upon the index number. If an item affected the fourth significant figure of the index number, it was included.

Although a single item may be excluded because it is not important, the entire group excluded may be significant when taken as a whole. It is believed, however, that in a group comprising construction materials, these small items will produce errors which are compensating rather than cumulative when considered together. That is, the index number for the group excluded will be essentially the same as the index number for the group included. In any event, if there is a de-

viation of the index of the excluded group from the index number of the group included, the error will be reduced in proportion to the relative significance of the latter group to the former. In other words, if the value of the group excluded is only 25% of the total value, a deviation of 10% in the index number of this group from the index number of the group included will produce an error of only 2½% in the latter index.

Overhead charges are of real significance. These items are excluded from the index number, however, because they are applied as a percentage to the total valuation after this has been determined. To attempt to include them in the index number here would defeat the purpose for which it is made and introduce a controversial element. The item of hauling excavated material is included under material rather than under labor as it is handled by contract and should not be allowed to bias the effect of track construction labor on the index number when the productivity factor of labor is included. This item may be isolated from the index of ma-

TABLE III. VALUE OF EACH ITEM OF MATERIAL IN THE TOTAL TRACK STRUCTURE AND THE COMPOSITE INDEX NUMBER OF TRACK MATERIALS
(Millions of dollars—1913=100%)

| Classification | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 |
|----------------------------------|--------|--------|--------|--------|--------|--------|--------|
| Rail—high tee and girder | 6.423 | 6.423 | 6.423 | 7.823 | 9.690 | 12.730 | 10.886 |
| Rail—low tee | 0.014 | 0.015 | 0.015 | 0.015 | 0.017 | 0.029 | 0.022 |
| Fish plates | 0.343 | 0.343 | 0.343 | 0.393 | 0.440 | 0.683 | 0.927 |
| Tie Rods | 0.236 | 0.179 | 0.179 | 0.324 | 0.430 | 0.430 | 0.473 |
| Tie plates | 0.950 | 0.950 | 0.970 | 1.089 | 1.188 | 1.247 | 1.270 |
| Screw spikes and clips | 0.238 | 0.207 | 0.177 | 0.434 | 0.583 | 0.583 | 0.617 |
| Hook-head spikes | 0.006 | 0.006 | 0.006 | 0.009 | 0.013 | 0.016 | 0.014 |
| Ties | 1.275 | 1.248 | 1.188 | 1.425 | 1.565 | 1.565 | 2.489 |
| Torpedo sand | 1.030 | 1.021 | 1.030 | 0.880 | 0.983 | 1.143 | 1.171 |
| Crushed stone | 1.751 | 1.998 | 1.998 | 1.618 | 1.998 | 2.531 | 2.284 |
| Portland cement | 1.911 | 1.911 | 1.949 | 2.503 | 2.790 | 3.268 | 3.631 |
| Granite paving blocks | 7.099 | 6.960 | 6.960 | 7.308 | 7.830 | 7.830 | 8.526 |
| Vitrified brick, paving | 0.210 | 0.210 | 0.210 | 0.262 | 0.262 | 0.308 | 0.360 |
| Creosoted wood blocks | 0.183 | 0.183 | 0.183 | 0.196 | 0.211 | 0.273 | 0.310 |
| Hauling excavated material | 1.208 | 1.357 | 1.301 | 1.561 | 1.765 | 2.788 | 2.788 |
| Total material | 22.877 | 23.011 | 22.932 | 25.840 | 29.765 | 35.424 | 35.768 |
| Index Number of material | 100.0 | 100.6 | 100.2 | 112.9 | 130.1 | 154.8 | 156.3 |

terial and shown as a separate index by using the data in Table III.

This grouping of materials is important as to time of selection as well as to the particular company selected. Steel ties, for example, would be a significant item for this particular group of companies today, but their installation has been confined to a relatively short and recent period. Consequently, it was excluded, although continued installation of steel tie construction would perhaps make this factor of sufficient importance to warrant its eventual inclusion in the index number. Other companies would undoubtedly find this item present in a large percentage of their track, particularly companies with light traffic streets predominating, and its inclusion would be quite necessary. Except for general uses, one is not warranted in drawing up a group of construction materials applicable to all periods and all companies.

The Problems of Weighting

In the case of street railway track construction, what we want to know is how the cost of the sample bill of ma-

terial has changed as a whole rather than how the various prices of the materials involved have changed on the average. We need also to consider whether the weights shall be fixed for a period or varied each year. If the weights are altered each year to correspond to changes which may take place in the track sample, we do not get an index which reflects the change in the cost of a constant bill of material. By fixing the bill of materials, price is the only variable and the index number reflects the changing valuation of a particular class of property. This bill of material is fixed when we select the significant types of track construction, determine the mileage of each type, and compute the quantities of the significant materials making up our sample.

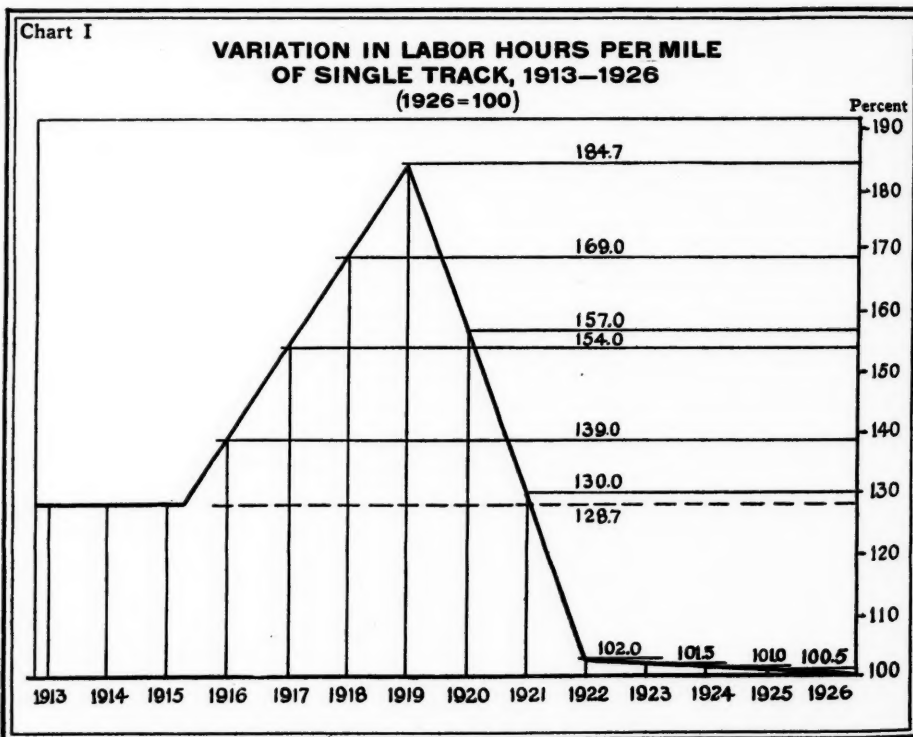
Admittedly, the fixing of the bill of materials is one of the limitations (as well as one of the advantages) of the use of index numbers in valuation work, since additions to the property after compilation of the sample bill of material or reconstruction of a considerable portion of the track of that sample may make necessary a recasting of the weights. However, as previously noted,

TABLE III (Continued). VALUE OF EACH ITEM OF MATERIAL IN THE TOTAL TRACK STRUCTURE AND THE COMPOSITE INDEX NUMBER OF TRACK MATERIALS

| Classification | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 |
|---------------------------------|--------|--------|--------|--------|--------|--------|--------|
| Rail—high tee and girder..... | 10.886 | 10.064 | 9.917 | 9.166 | 9.502 | 9.502 | 9.502 |
| Rail—low tee..... | 0.022 | 0.020 | 0.019 | 0.019 | 0.019 | 0.020 | 0.020 |
| Fish plates..... | 0.927 | 0.814 | 0.645 | 0.862 | 0.889 | 0.889 | 0.889 |
| Tie rods..... | 0.502 | 0.351 | 0.308 | 0.393 | 0.401 | 0.341 | 0.352 |
| Tie plates..... | 1.498 | 1.138 | 0.752 | 1.088 | 1.039 | 1.007 | 0.891 |
| Screw spikes and clips..... | 0.698 | 0.518 | 0.446 | 0.471 | 0.471 | 0.488 | 0.488 |
| Hook-head spikes..... | 0.019 | 0.013 | 0.010 | 0.012 | 0.012 | 0.011 | 0.011 |
| Ties..... | 3.378 | 1.998 | 2.375 | 2.824 | 2.521 | 2.677 | 2.762 |
| Torpedo sand..... | 1.723 | 2.023 | 1.513 | 1.612 | 1.405 | 1.405 | 1.405 |
| Crushed stone..... | 4.187 | 4.473 | 4.282 | 3.806 | 3.711 | 3.293 | 3.140 |
| Portland cement..... | 3.822 | 2.886 | 3.698 | 4.032 | 4.013 | 3.918 | 3.726 |
| Granite paving blocks..... | 9.918 | 11.310 | 11.310 | 11.554 | 11.658 | 11.658 | 11.658 |
| Vitrified brick, paving..... | 0.400 | 0.384 | 0.368 | 0.360 | 0.348 | 0.310 | 0.302 |
| Creosoted wood blocks..... | 0.432 | 0.303 | 0.278 | 0.315 | 0.303 | 0.303 | 0.308 |
| Hauling excavated material..... | 5.575 | 4.460 | 5.203 | 5.203 | 5.203 | 5.761 | 5.761 |
| Total material..... | 43.987 | 40.755 | 41.124 | 41.717 | 41.495 | 41.583 | 41.215 |
| Index Number of material..... | 192.3 | 178.1 | 179.8 | 182.7 | 181.4 | 182.1 | 180.5 |

as long as the computations are confined to a particular location, the error in the index number of costs on account of changes in the weights will ordinarily be small over a comparatively long period of years. In the present example, the weight assigned to the various items of material will continue to be accurate for many years to come unless the companies undertake an extensive reconstruction or extension program or receive relief from the paving burden. The index number developed here is designed primarily to carry forward or project backward an existing valuation as of a particular date, and additions to or abandonments of property are necessarily handled separately. The index number may, however, be applied also to these factors to make them reflect a valuation on the desired price level.

In developing this index number, aggregates of money prices are used and the problem of assigning to each item of material a "weight" corresponding to the relative importance of that item in the total track structure is solved as soon as we compute the total quantity of each item in the sample. The relative weight or significance of one item to the total is the money value of that item. The computations are therefore mathematically accurate, are easily understood, and may be submitted to a regulatory commission with as much confidence of approval as in the case of any physical valuation. It is a method for keeping a valuation constantly up to date and is just as logical a method of so doing as the more laborious procedure of keeping a perpetual inventory of property. When once compiled, such



an index number may be continued with a small amount of labor and may be used in conjunction with modern supervised accounting methods to present a valuation of physical property at any time on such basis as may be found desirable.

Selecting the Base Year

The base year to be selected will depend upon the desires of the user of the data. Inasmuch as the data presented here consist of the aggregates of money prices, the selection of the base year need not be made until the end of the computation. For purposes of valuation it is especially important that the data be in such form that the base year can be shifted as desired. This is one of the principal advantages claimed for the use of geometric means. However, geometric means are more laborious to compute and are not so easily understood as aggregates of money prices. By computing physical quantities as weights and multiplying these weights by the actual prices, we secure an index number which is independent of any base year.

Inasmuch as 1913 is favored as the base year for many index numbers because the so-called pre-war normal conditions then existed, it was considered advisable to establish the index number on that base for purposes of comparison with other similar construction cost indexes. The data, as set up, can be shifted to any other base year and combinations such as three-, five-, or ten-year averages, year-to-year or chain indexes, maximum and minimum valuations, and other comparisons can readily be determined without recomputation of the data. The index number which is obtained in this manner is not empirical or "synthetic."

Determining the Actual Prices of the Materials Selected

Market prices are used as the basis of most so-called "general purpose" index numbers. However, where the index number is designed for some special purpose, such as the one considered here, contract prices or combinations of contract prices with market prices may serve to even better advantage than market prices alone. This is especially true where the commodities entering into the index number are of a more or less specialized nature. The market for such commodities is likely to be limited and market prices may be difficult to obtain. Prices of such commodities do not as a rule fluctuate as rapidly as do the prices of food and other staples. Thus contract prices, if fairly distributed throughout the year, provide a very good basis for computing accurate indexes.

In this compilation, contract prices were used except in a few cases where they were not available. In these instances the relative market prices were used to interpolate the contract prices. The relative prices, made from the ac-

TABLE IV. LABOR HOURS REQUIRED TO BUILD THE
TOTAL TRACK SAMPLE—VARIATION IN LABOR
PRODUCTIVITY BASED ON CHART I
(Multiplier on base year 1926)

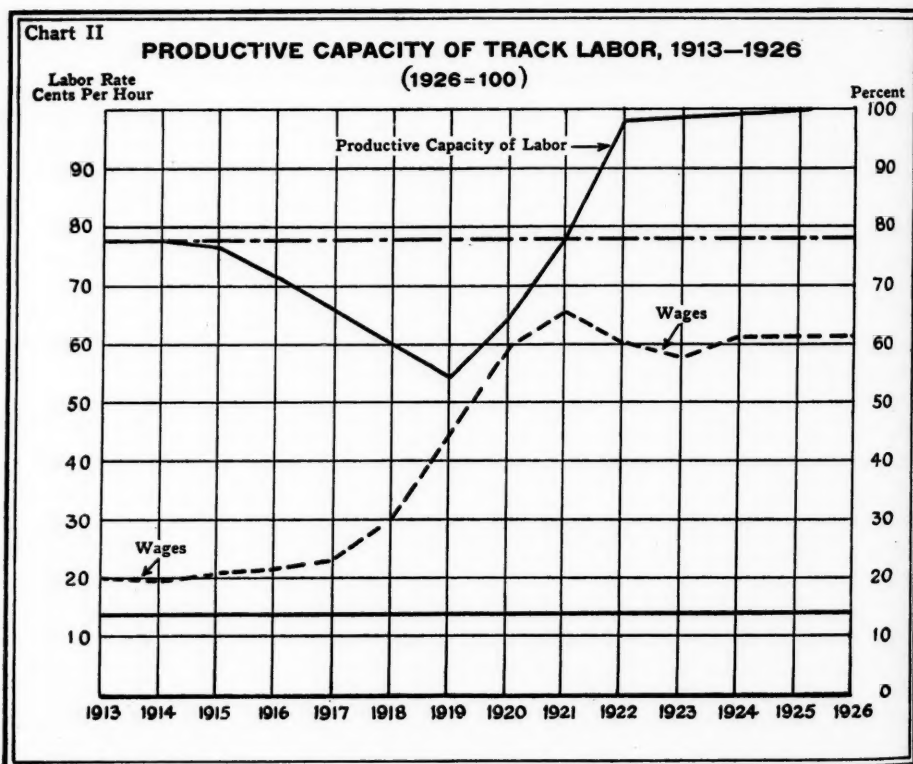
| Year | Base | Multiplier |
|-----------|------------|------------|
| 1926..... | 37,584,601 | 1.00 |
| 1925..... | 37,772,525 | 1.005 |
| 1924..... | 37,960,447 | 1.01 |
| 1923..... | 38,148,370 | 1.015 |
| 1922..... | 38,336,293 | 1.02 |
| 1921..... | 48,108,289 | 1.28 |
| 1920..... | 59,007,824 | 1.57 |
| 1919..... | 69,426,275 | 1.8472 |
| 1918..... | 63,517,976 | 1.69 |
| 1917..... | 57,880,286 | 1.54 |
| 1916..... | 52,242,595 | 1.39 |
| 1915..... | 48,859,981 | 1.30 |
| 1914..... | 48,382,657 | 1.2873 |
| 1913..... | 48,382,657 | 1.2873 |

tual prices on a percentage scale, are given in Table II. These relative prices represent the average for the year, that is, the total cost of all of the units purchased in the year divided by the total number of such units. The requirements of this particular group of companies were large enough to give a fairly good dispersion of purchases throughout the year.

It should be noted, however, that during periods of high prices construction is usually curtailed and contract prices may not accurately reflect changes of market prices. The efficiency of the purchasing department as well as that of the construction department enters into this sort of selection because of the probable variation in purchases made with changes in the market prices. In

other words, the tendency of contract prices should be toward a yearly average lower than the average for market prices, assuming efficiency in the periodical ordering and purchasing of material requirements. The contract price also gives effect to savings resulting from large purchases. Savings from cash discounts are not considered.

The point of delivery also enters into the determination of what constitutes the actual price. Freight, warehouse charges, hauling, handling and the like, are factors entering into the cost of material for which some definite rule must be laid down and followed in the collection of the price data. In this study the cost of the material is the cost laid down in the companies' store-yards. The cost of hauling the material to the



job is included in the labor hours analysis. The weighted value of each item of material in the track structure, computed in accordance with the preceding principles, and the composite index number of track materials are shown in Table III. The material is given in millions of dollars and the index number is based on 1913 as 100%.

The Factor of Labor Productivity

The street railway industry faced a particularly difficult situation from 1914 to 1919. The five-cent fare seemed to be a fixture. Some relief was obtained in the way of fare increases in 1918, but in many cases—and this applied to the group of companies studied here—fare increases were not obtained until 1919. Rising material costs had to be met by the companies, but considerable resistance was offered to the payment of higher wages. This resistance came from necessity rather than from choice. In the meantime, other industries, unburdened with the control exercised by the slow-moving machinery of regulation, were expanding and offering attractive wages to laborers. Many of the workers left the companies to take work in industries paying higher wages and many others left to join the military forces. The supervisory personnel was likewise affected. The result of this situation was that the companies lost their trained track construction personnel and had to use the poorest grade of labor.

The result of the use of a continually changing force of "green" men was that labor costs mounted rapidly in spite of the maintenance of a low wage rate. The effect of this important factor on the index number of track construction costs is lost completely where the weight given to the labor item is constant

throughout the period considered. This labor productivity factor is perhaps of more importance in the case of street railway construction cost indexes than of those of any other industry. Attention will be given here to the use of labor-saving machinery as an element in this variable productivity factor.

In order to determine the variation in labor productivity, a heavy type of paved track construction was analyzed. This type of construction was typical for the group of companies studied. The variation in the number of labor hours required to build one mile of single track of this type of construction from 1913 to 1926 is plotted on a percentage basis on Chart I, using 1926 as 100%. Since the index number is derived by multiplying hours of labor by the wage rates in each year, it does not matter what year of the series is taken as 100% as far as the final result is concerned. In the year 1926 the productivity of track labor was found to be greater than that in any other year in the series, and it seemed logical to assign 100% to the total hours of labor required for 1926. The final index number for each year will be the same no matter what year is taken as 100%.

TABLE V. CALCULATION OF LABOR PRODUCTIVITY
ON BASIS OF CHART I.
(1926 = 100%)

| Year (1) | Multiplier (Table IV) in Percentage (2) | Deduct 100% (3) | Divide Column 3 by Column 2, Percentage (4) | Percentage Productivity Deduct Column 4 from 100% (5) |
|-------------|---|-----------------------|---|--|
| 1926 | 100.0 | 0.0 | 0.0 | 100.00 |
| 1925 | 100.5 | 0.5 | 0.497 | 99.503 |
| 1924 | 101.0 | 1.0 | 0.99 | 99.010 |
| 1923 | 101.5 | 1.5 | 1.477 | 98.523 |
| 1922 | 102.0 | 2.0 | 1.96 | 98.040 |
| 1921 | 128.0 | 28.0 | 21.875 | 78.125 |
| 1920 | 157.0 | 57.0 | 36.305 | 63.695 |
| 1919 | 184.72 | 84.72 | 45.864 | 54.136 |
| 1918 | 169.0 | 69.0 | 40.828 | 59.172 |
| 1917 | 154.0 | 54.0 | 35.064 | 64.936 |
| 1916 | 139.0 | 39.0 | 28.057 | 71.943 |
| 1915 | 130.0 | 30.0 | 23.076 | 76.924 |
| 1914 | 128.73 | 28.73 | 22.318 | 77.682 |
| 1913 | 128.73 | 28.73 | 22.318 | 77.682 |

The percentage variation shown on Chart I, although based on one type of track construction only, is applied to each of the different types considered in determining the total number of labor hours of the sample for each year from 1913 to 1926 (Table IV). Here, again, it should be evident that these quantities are not dependent on what year is taken as 100% productivity. The only assumption made in this computation is that the variation in productive capacity was the same for every type of track on the system. Knowing the variation in this productive capacity for the principal type of construction, the multiplier shown on Chart I was applied to the total labor hours required to build all the track of the sample in 1926, and for each of the preceding years back to 1913 (Table IV). From the multiplier shown in Table IV, we are able to compute the labor productivity in percentages, using 1926 as 100%, as already explained. These computations are shown in Table V and plotted on Chart II, together with the average

wage rate for a construction gang in cents per hour.

Multiplying the total labor hours for each year as shown in Table IV, by the average rate per hour for that year gives the total labor cost of straight track construction by years from 1913 to 1926. The results of these computations give the relation between labor cost, labor wages, and labor productivity, as shown in Table VI and plotted on Chart III. The curve of labor cost per mile of single track is shown as a resultant of the two factors of wages and productive capacity.

It will be noted from Chart III that the curve of labor cost per mile of single track began its downward trend in 1920 in spite of increasing wage rates. This followed the increase of labor productivity which began about 1919. Labor productivity was restored to the 1913 level by 1921. The decline in the labor cost curve continued sharply until 1922. At this time there was a marked slackening of the rate of increase in labor productivity, yet in

TABLE VI. TRACK LABOR, 1913-1926—AGGREGATE LABOR COST OF TOTAL TRACK SAMPLE

Based on: (1.) Aggregate labor hours in 1926 taken as constant for each year (column 3).
(2.) Productive capacity of labor with 1926 taken as 100% (column 6).

| Year | 1. Average Rate Per Hour, for Construction Crews, Including Foremen, Watchmen, Pavers and Laborers* | 2. Index No. of Wages (1913=100) | 3. Total No. Hrs. Using Base Year 1926 as Constant | 4. Cost of Labor† (col. 1 X col. 3) (millions) | 5. Productivity of Labor‡ 1926 = 100 Table V column 5 | 6. Total No. Hrs. Based on 100% Efficiency in 1926, Chart I Table IV | 7. Cost of Labor (col. 1 X col. 6) (millions)§ | 8. Index No. of Col. 7 |
|------|--|---|---|--|--|---|---|---------------------------------|
| 1913 | \$0.20 | 100 | 37,584,601 | \$ 7.5169 | 77.682 | 48,382,657 | \$ 9.6765 | 100 |
| 1914 | 0.19 1/2 | 97.5 | 37,584,601 | 7.3290 | 77.682 | 48,382,657 | 9.4346 | 97.5 |
| 1915 | 0.20 3/8 | 103.3 | 37,584,601 | 7.7676 | 76.924 | 48,850,981 | 10.0979 | 104.4 |
| 1916 | 0.21 | 105.0 | 37,584,601 | 7.8928 | 71.943 | 52,242,595 | 10.9709 | 113.4 |
| 1917 | 0.22 1/2 | 112.5 | 37,584,601 | 8.4565 | 64.936 | 57,880,286 | 13.0231 | 134.6 |
| 1918 | 0.29 2/5 | 148.3 | 37,584,601 | 11.1502 | 59.172 | 63,517,976 | 18.8439 | 194.7 |
| 1919 | 0.43 1/2 | 217.5 | 37,584,601 | 16.3493 | 54.136 | 69,426,275 | 30.2004 | 312.1 |
| 1920 | 0.59 | 295.0 | 37,584,601 | 22.1749 | 63.095 | 59,007,824 | 34.8146 | 359.8 |
| 1921 | 0.65 1/2 | 327.5 | 37,584,601 | 24.6179 | 78.125 | 48,108,289 | 31.5109 | 325.6 |
| 1922 | 0.60 3/8 | 302.5 | 37,584,601 | 22.7387 | 68.040 | 38,336,293 | 23.1935 | 239.7 |
| 1923 | 0.37 1/2 | 287.5 | 37,584,601 | 21.6111 | 68.523 | 38,148,370 | 21.9353 | 226.7 |
| 1924 | 0.61 | 305.0 | 37,584,601 | 22.9266 | 99.010 | 37,960,447 | 23.1559 | 239.3 |
| 1925 | 0.61 | 305.0 | 37,584,601 | 22.9266 | 99.503 | 37,772,525 | 23.0412 | 238.1 |
| 1926 | 0.61 | 305.0 | 37,584,601 | 22.9266 | 100.0 | 37,584,601 | 22.9266 | 236.9 |

* Chart II.

† Curve 2, Chart IV.

‡ Chart III.

§ Curve 1, Chart IV.

1926 the productivity was approximately 22% greater than it was in 1913.

To What Extent Is This Increased Productivity Due to Increased Labor Efficiency?

The above analysis, when supplemented by a study of the use of power tool equipment, leads to the conclusion that at least two elements enter into this factor of labor productivity—namely, labor efficiency, and the development of the use of labor-saving machinery. Although it is impossible to assign a precise increment of value to each of these elements, we are warranted in arriving at a fairly definite conclusion as to which of the two is the greater.

A study of the use of power tool equipment in the group of companies considered here reveals that few changes were made in this equipment during the period from 1913 to 1920. The diminishing productivity of labor during these years, as shown on Chart II, can therefore be attributed entirely to declining labor efficiency brought about by the decreasing purchasing power of wages and the general demoralization incident to the World War.

By the end of 1919, however, fare increases had made possible rather marked increases in wages, and by 1920 the real wages of the track laborers were higher than they were in 1913. Then it was once more possible to organize and maintain a trained track construction personnel. This situation is shown on Chart II by a marked increase in labor productivity following 1919. The change from the 10-hour to the 8-hour day undoubtedly contributed to this increase, partly because of the element of

fatigue but principally because work on heavy traffic streets was avoided during the early morning and evening rush hours. However, it is reasonable to assume that the actual increase in the efficiency of labor itself reached its maximum shortly after the time that the wages of labor caught up with the cost of living, namely about 1920, for at this point labor turnover decreased to a minimum and a year-round track construction force was again established. It is not a mere coincidence that the productivity of labor was restored to the 1913 level shortly after this point. In other words, as soon as the disrupting influences of the war were removed and wages rose to a point where they equaled or exceeded the level in 1913, the stability and efficiency which existed in 1913 were restored and any further increases in labor productivity must be attributed to some other factor, or factors, than that of labor efficiency.

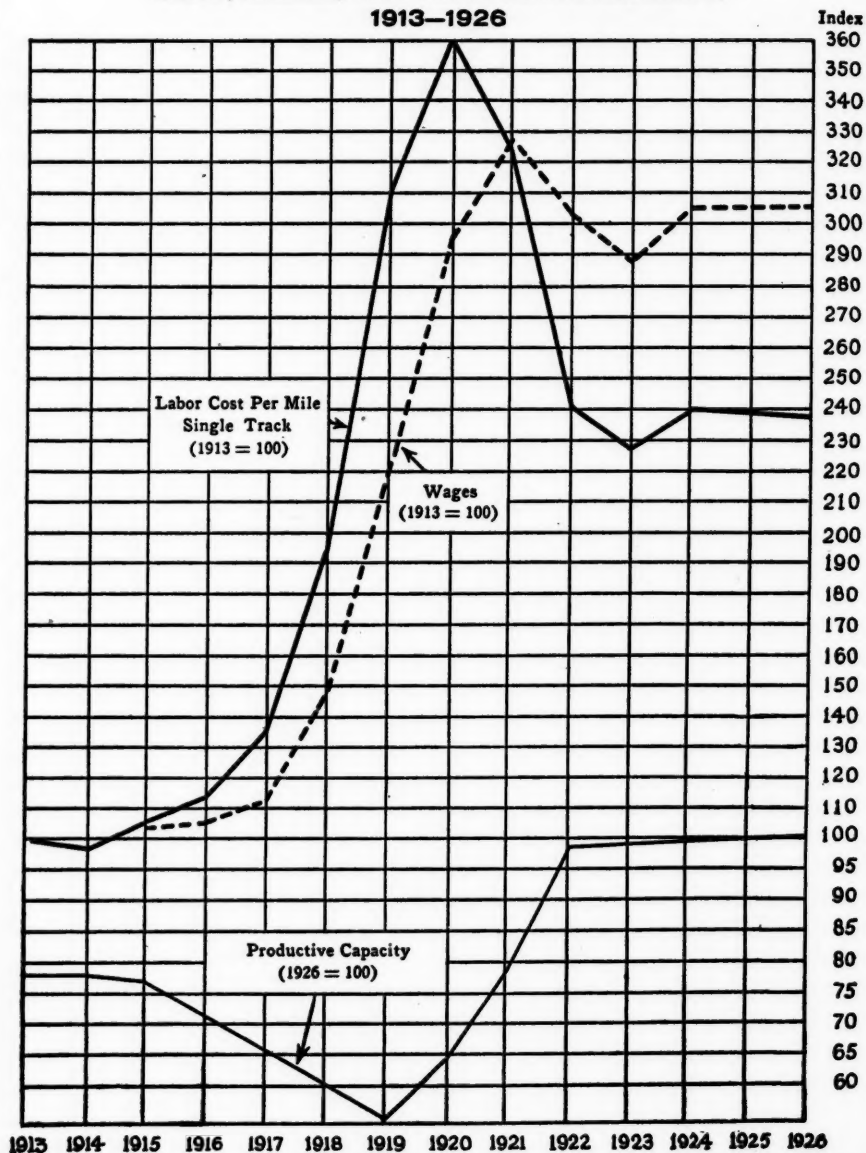
The other factor of importance to which we can attribute the increase in labor productivity from 1921 to date is the increased use of labor-saving machinery. This factor is assignable to efficiency in management. An analysis of the purchases of new and additional power tools since 1920 tends to verify this conclusion. In one class of small power tools alone the valuation in 1926 was 278% of the valuation in 1922. The value of all power tools and equipment increased approximately 200% in the last four years.

What this means in savings in labor costs is illustrated by Chart III. In 1921, wages and labor costs were both approximately 225% higher than they were in 1913. In 1926 wages were 206% higher than in 1913 and labor costs were only 138% higher than in 1913. It seems reasonable to assume that a large part of this spread between

labor costs and wages in the last five years is directly assignable to the increased use of power tool machines and is the justification for their use.

Chart III

**TRACK LABOR RELATION BETWEEN
COST, WAGES, AND PRODUCTIVE CAPACITY,
1913-1926**



We say "a large part" only of this spread is due to the use of power tool machinery because other factors also contributed to the increased productivity. If increasing purchasing power of the laborer's income provides incentive for greater effort on the part of the laborer, then credit must be given him in some degree; for while productivity was increasing from 1921 to 1926, real wages were also rising during this period in spite of a decline in wage rates. Furthermore, some consideration must be given to the fact that the higher real wages during this period may have resulted in securing more efficient laborers, although this factor was probably fairly well discounted by 1921, when the 1913 level of real wages was again reached. At least, no perceptible change in the class of labor has been noted by the writer in the construction forces of this particular group of companies since that date. The further increase in real wages from this point on, if this premise is correct, resulted in what might be called a laborer's surplus and did not inspire any perceptible increased effort on his part.

The decreasing purchasing power of

the laborer's wage, prior to 1919, was not entirely the cause of the decreasing efficiency, but was rather the cause of the disruption of the organization, and this disruption resulted in lowered efficiency because of the poorer grade of labor employed. Similarly, the increased efficiency since 1919 indicates a stabilization of the labor force on a higher plane rather than increased efficiency of the laborer as such. Inasmuch as the period of readjustment may be said to have extended from 1919 to 1921 (Chart II), the conclusion is drawn that the standards of labor economy had returned to the 1913 level by 1921.

Although this comparison with pre-war standards of labor efficiency seems justified, it must be understood that the use of 1913 as a base does not imply 100% labor economy in 1913 any more than the use of 1926 as the base year for 100% productivity implies that no further increases in labor productivity may be expected in the future. As a matter of fact, if labor efficiency is in any way related to real wages, it is clear that 1913 was not a year of 100% labor economy as compared with, say

TABLE VII. COST OF LABOR IN THE TOTAL TRACK STRUCTURE AND THE INDEX NUMBER OF LABOR COST, 1913 = 100*

(1) Labor productivity taken as a constant. (2) Labor productivity taken as a variable.
(1926=100% productivity)

| | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 |
|---|--------|--------|--------|--------|--------|--------|--------|
| (1) Cost of labor (millions of dollars) | 7.517 | 7.329 | 7.768 | 7.893 | 8.456 | 11.150 | 16.349 |
| Index number of labor cost..... | 100.0 | 97.5 | 103.3 | 105.0 | 112.5 | 148.3 | 217.5 |
| (2) Cost of labor (millions of dollars) | 9.677 | 9.435 | 10.098 | 10.971 | 13.023 | 18.844 | 30.200 |
| Index number of labor cost..... | 100.0 | 97.5 | 104.4 | 113.4 | 134.6 | 194.7 | 312.1 |
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 |
| (1) Cost of labor (millions of dollars) | 22.175 | 24.618 | 22.739 | 21.611 | 22.927 | 22.927 | 22.927 |
| Index number of labor cost..... | 295.0 | 327.5 | 302.5 | 287.5 | 305.0 | 305.0 | 305.0 |
| (2) Cost of labor (millions of dollars) | 34.815 | 31.511 | 23.194 | 21.935 | 23.156 | 23.041 | 22.927 |
| Index number of labor cost..... | 359.8 | 325.6 | 239.7 | 226.7 | 239.3 | 238.1 | 236.9 |

* See Table VI and Charts I, II, and III.

1907, for the purchasing power of wages as measured by the cost of living declined from 1907 to 1913.

Some consideration must also be given to the fact that training and experience in the use of power tools result in increased labor efficiency. Whether such progress may be imputed to the machinery or credited to the laborer is a debatable question. In any event, the improvement in the laborer's efficiency due to training and experience probably does not extend over a very long period of time. Six months would be a liberal estimate of the time required to develop maximum efficiency in the comparatively simple tasks assigned to a track laborer. Nevertheless, all these factors influencing greater efficiency were fairly well discounted by 1921 so that the principal factor from 1921 to 1926 was the increased use of labor-saving machinery.

On Chart IV is shown the index number of track construction costs (labor and material) of the group of companies studied from 1913 to 1926. Curve 1 represents actual costs; that is, due consideration is given to the factor of labor productivity. Curve 2 represents actual costs as far as material is concerned, but labor is weighted as 100% efficient throughout the period from 1913 to 1926; in other words, the factor of labor productivity is ignored. The spread between Curves 1 and 2 on Chart IV from 1913 to 1921 reflects the increased cost of track construction due to decreased labor efficiency. The spread between Curves 1 and 2 from 1921 to 1926 reflects the savings in cost resulting largely from the increased use of power tools.

Since the courts and commissions have in general refused to allow valuations on the basis of reproduction cost at the peak period of 1920 on the grounds of unreasonableness, it is unfair to penal-

ize the companies during the period from 1921 to 1926 for the efficiency of management which has resulted in a lower reproduction cost during this period than would have resulted under a labor productivity equivalent to that which existed in 1913. The amount of this penalty from 1921 to 1926 is approximately equivalent to the area between Curves 1 and 2 on Chart IV.

The Composite Index Number

The cost of labor in the total track structure and the index number of track labor are given in Table VII. The quantities are total labor hours times average labor rate expressed in millions of dollars. In one case labor productivity is considered as a constant throughout the period and in the other case it is considered as a variable. By combining the money cost of track materials in each year (Table III) with the money cost of labor (Table VII), the properly weighted total cost of straight track construction for each year is obtained (Table VIII). This is the final, composite index number of straight track construction costs. Here, again, a separation is made between the index numbers on account of variable labor productivity.

Application

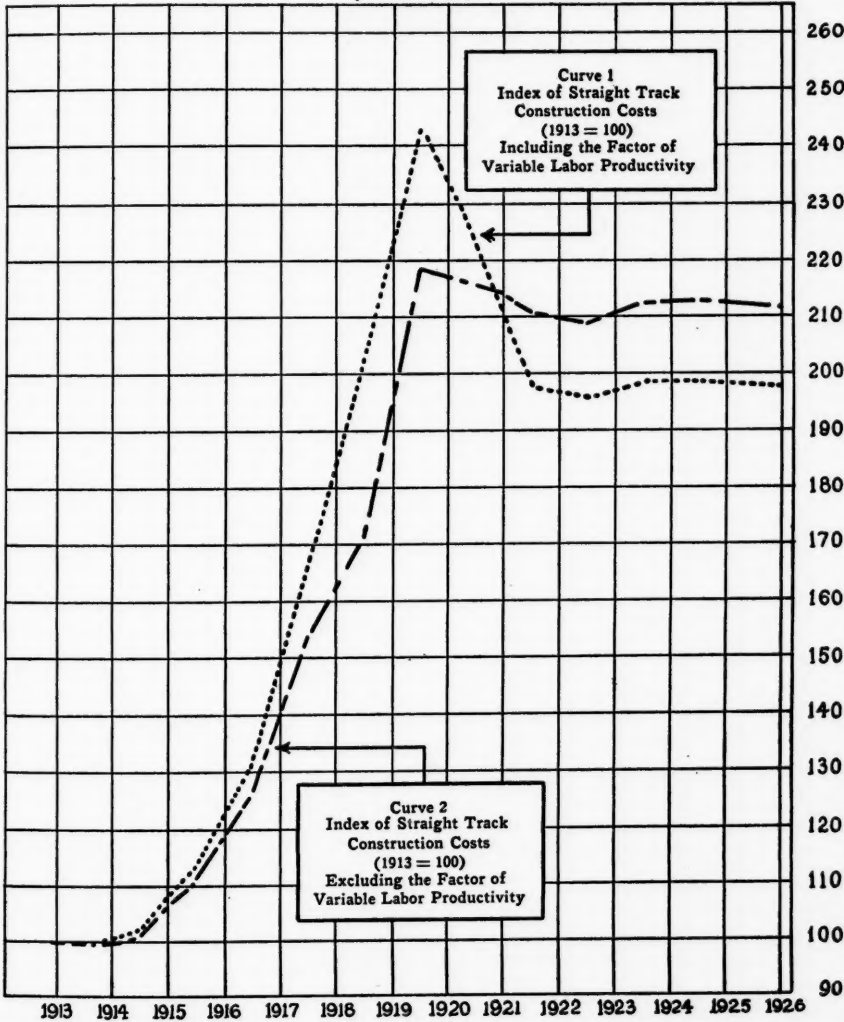
The application of the principles laid down in the preceding sections to the balance of the street railway property is necessary before the management may be sure that a revaluation of its properties is advisable. By applying the same methods of analysis to the remaining principal parts of the property, a composite index number may be constructed which will reflect accurately from year to year the trend of the total

cost of the combination of labor and materials which constitutes the entire property and plant. For purposes of valuation, the data must be of such a nature that they can be submitted to,

and stand up under, the critical examination of courts and commissions. For such a purpose, there are many cases where an index of construction costs can be developed for a particular company

Chart IV

TREND OF STRAIGHT TRACK CONSTRUCTION COSTS, 1913-1926
(1913=100)



and applied to an already existing valuation with as much accuracy and much less expenditure of time and money than are required for a revaluation.

It should be clear that such an index number will not apply accurately to all other street railway properties and certainly not to other public utilities such as gas, electric light, and telephone properties. Not only are there differences in the construction cost indexes of different types of public utilities, but there are rather wide differences in the indexes developed by different authorities for the same type of utility. In Table IX, the composite indexes of construction costs for the physical property of typical utilities are presented.

¹ These differences in index numbers from 1913 to 1926 are not actual differences, since some dispersion existed in 1913. They represent additional differences. It is also necessary to eliminate that dispersion which is purely a function of increasing size. This may be done by determining the ratio by which each index number increases or decreases as related to some base, such as the simple average of all the indexes. The actual

Are Public Utility Construction Costs Stabilized?

In the Indianapolis Water Company case, decided November 22, 1926, the Supreme Court based its decision favoring the "spot" reproduction cost theory largely on the idea that a new plateau of stabilized prices had been reached. These prices, the Court felt, were likely to continue for a reasonable period in the future. Examination of Table IX indicates that, taking the utility group as a whole, a state of normalcy in construction costs, or anything resembling it, does not exist.¹ We may assume that the wide divergence in the indexes of different types of utilities is caused, in

additional deviations over such deviations as may have existed between the indexes of the several utilities in 1913 will then be expressed as ratios of each index number to the average index number. Such a computation has been made and reveals that the maximum dispersion, 40.5 points, occurred in 1917 instead of 1920, as indicated in Table IX. It also shows that the dispersion in 1924 was nearly as great as in 1917, namely 35.6 points.

TABLE VIII. COST OF LABOR AND MATERIAL IN THE TOTAL TRACK STRUCTURE AND THE COMPOSITE INDEX NUMBER OF STRAIGHT TRACK CONSTRUCTION COSTS*

(1) Labor productivity taken as a constant.

(2) Labor productivity taken as a variable.

| | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 |
|---|--------|--------|--------|--------|--------|--------|--------|
| (1) Cost of labor and material (millions of dollars)..... | 30.394 | 30.340 | 30.700 | 33.733 | 38.221 | 46.574 | 52.117 |
| Index number of labor and materials..... | 100.0 | 99.8 | 101.0 | 111.0 | 125.7 | 153.2 | 171.5 |
| (2) Cost of labor and material (millions of dollars)..... | 32.554 | 32.446 | 33.030 | 36.811 | 42.788 | 54.268 | 65.968 |
| Index number of labor and materials..... | 100.0 | 99.7 | 101.4 | 113.1 | 131.4 | 166.7 | 202.7 |
| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 |
| (1) Cost of labor and material (millions of dollars)..... | 66.162 | 65.373 | 63.863 | 63.328 | 64.422 | 64.510 | 64.142 |
| Index number of labor and materials..... | 217.7 | 215.1 | 210.1 | 208.3 | 211.9 | 212.2 | 211.0 |
| (2) Cost of labor and material (millions of dollars)..... | 78.802 | 72.266 | 64.318 | 63.652 | 64.651 | 64.624 | 64.142 |
| Index number of labor and materials..... | 242.1 | 222.0 | 197.6 | 195.5 | 198.6 | 198.5 | 197.0 |

* See Chart IV, Curves 1 and 2

part at least, by economic differences inherent in each type. The electric light and power industry, for example, is distinctive in this respect because of the marked savings in unit production costs possible with expansion in the industry. These savings are reflected in construction costs. No such savings are possible in the water properties or street railway utilities. The proportionate use of raw materials and finished products also bears on the relative construction costs of different utilities. This difference is marked in the street railway and telephone industries where increasing labor productivity in the use of raw materials affects the former and greater labor efficiency in the factory affects the latter. Moreover, development in the art of cable construction has had an important bearing upon the lowering of construction costs in the telephone industry. These are inherent differences among the several utilities; we may expect, therefore, that dispersion in the levels of their construction cost indexes will continue to exist.

On the other hand, certain price influences may tend to narrow the existing dispersion. The first of these is a possible decrease in the building construction activity of the country. The

lowering of prices for construction materials, which would follow such a depression, would affect greatly the users of raw materials, namely, water, gas, and street railway utilities. A second influence is the possible increase in the price of copper. Such an increase would tend to raise the construction costs of electric light, power, and telephone utilities. These two influences, if concurrently applied, would bring the construction cost indexes closer together.

Conclusions

Thus, instead of being on a new level of stable prices, considerable readjustment may be expected in the construction costs of public utilities. The water, gas, and street railway companies have a greater possibility for lowering construction costs than has any other type, as far as price influences are concerned.

In any event, as long as the courts uphold reproduction cost as a principal basis for fair value, the owners of utility property are vitally interested in knowing how the reproduction cost of their property is varying. It has been pointed out that increasing the productivity of labor tends to decrease the reproduction cost of the property. It

TABLE IX. COMPARISON OF VARIOUS PUBLIC UTILITY CONSTRUCTION COST INDEXES

| Year | Electric Railway | | | Interurban Railroad | Electric Light and Power Company | | Telephone Companies | Artificial Gas Companies | | Water Company |
|------|------------------|-------|-------|---------------------|----------------------------------|-------|---------------------|--------------------------|-------|---------------|
| | 100* | 100† | 100‡ | | 100 | 100† | | 100 | 100† | |
| 1913 | 100* | 100† | 100‡ | 100 | 100 | 100† | 100 | 100 | 100† | 100 |
| 1914 | 94.0 | 98 | 99.7 | 100 | 99 | 98 | 96 | 97 | 98 | 95 |
| 1915 | 97.3 | 106 | 101.4 | 103 | 102 | 105 | 101 | 100 | 103 | 99 |
| 1916 | 119.8 | 132 | 113.1 | 126 | 117 | 130 | 114 | 132 | 126 | 129 |
| 1917 | 162.7 | 168 | 131.4 | 158 | 146 | 156 | 135 | 182 | 184 | 197 |
| 1918 | 162.5 | 199 | 166.7 | 183 | 166 | 182 | 149 | 193 | 221 | 213 |
| 1919 | 205.1 | 209 | 202.7 | 192 | 187 | 195 | 166 | 199 | 228 | 212 |
| 1920 | 244.7 | 230 | 242.1 | 229 | 216 | 207 | 192 | 243 | 256 | 271 |
| 1921 | 200.7 | 191 | 222.0 | 204 | 186 | 179 | 184 | 210 | 200 | 220 |
| 1922 | 175.2 | 184 | 197.6 | 178 | 166 | 181 | 171 | 183 | 190 | 197 |
| 1923 | 200.2 | 199 | 195.5 | 207 | 177 | 190 | 177 | 216 | 209 | 234 |
| 1924 | 204.6 | 202 | 198.6 | 220 | 180 | 191 | 170 | 230 | 213 | 243 |
| 1925 | 202.4 | ..... | 198.5 | 222 | 178 | ..... | 167 | 230 | ..... | 233 |
| 1926 | 202.6 | ..... | 197.0 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

* *Electric Railway Journal*, Vol. 69, Jan. 1, 1927, p. 29. (Developed by Albert Richey from American Electric Railway Association statistics).

† L. R. Nash, *Economics of Public Utilities*, p. 158.

‡ Index number developed in this paper, limited to straight track construction costs in a particular group of companies.

also tends to decrease operating costs and increase earnings. The point to be emphasized is that the efficiency of management and labor which brings about increased labor productivity and decreased costs should not be penalized to the full extent of the savings realized. The public rightfully expects to share in the gains of such efficiency. However, the principal gains to the public should be in the form of betterment of the service, and for such betterment the management is justified in expecting compensation.

In the writer's opinion "special purpose" indexes will be more widely used as their various applications become more generally recognized. The initial computation is laborious, but it is accurate and designed to satisfy courts and commissions. It is not contended, however, that a final valuation figure can be secured by the use of the index number. That requires more than an adding machine. The power to create demand and produce earnings is an element of value which cannot be determined by mathematical computation. Only as physical property is able to produce earnings does it have a positive value.

However, the application of the index number of present construction costs to a previously accepted valuation, with proper adjustments for additions, betterments, and abandonments subsequent to the date of that valuation, will produce a new valuation as accurately as is warranted when one considers the other variable and intangible factors which must be determined. At best, expert opinions of physical value will

vary widely and the principal effort, after all, should be directed toward the elimination of gross differences between capitalization and investment. In this effort it is neither essential nor desirable to pursue a hair-splitting policy. Prices are constantly changing—so much, in fact, that no such thing as a "normal" price can be found over any considerable period of time.

Moreover, when an index number of public utility construction costs is developed, it must be remembered that its application to an existing valuation will perpetuate and perhaps increase or decrease the significance of mistakes in that valuation which have been caused by favorable or unfavorable market conditions, advantageous or disadvantageous contracts, mistakes in inventories, and differences due to piecemeal construction. If such questions of merit are raised, however, they need not destroy confidence in the index number as such; rather do they indicate defects in the original valuation.

Finally, let it be said that while all index numbers are not adequate representations of all the facts which they pretend to summarize, knowledge of them is as yet limited in the many fields of application open to their use. More fields should be investigated and wider use made of the advantages to be secured. In a realm of constantly changing prices, the index number gives insight into the complications of rate proceedings and serves to emphasize the fact that the word "dollar" has but one meaning when applied to opposing parties in an investigation of a proper rate-base.

FREIGHT RATES AND THE HOCH-SMITH RESOLUTION

By D. PHILIP LOCKLIN

THE agricultural depression which followed the World War, like the similar depression in the 70's of the last century, was accompanied by efforts to secure lower freight rates. The Hoch-Smith Resolution,¹ approved by the President on January 30, 1925, was a direct result of the farmers' post-war difficulties. The resolution was sponsored by the "farm bloc" and was intended to afford some measure of relief to agriculture through lower rates on farm products. The results of the rate structure investigation which the resolution requires must be awaited before the last word can be said concerning the effect of the resolution upon freight rates.² Nevertheless, the resolution has been discussed and interpreted by the Interstate Commerce Commission in a number of recent cases and has had a decided influence on the Commission's decisions. It is the purpose of this article to discuss the changes in rate policy brought about by the resolution and to point out actual results of the resolution as seen in recent decisions.

Provisions of the Resolution

The provisions of the Hoch-Smith Resolution may be summarized as follows:

1. A "true policy" of rate making is announced. "... It is hereby declared to be the true policy in rate mak-

ing to be pursued by the Interstate Commerce Commission in adjusting freight rates that the conditions which at any given time prevail in our several industries should be considered in so far as it is legally possible to do so, to the end that commodities may freely move."

2. The Interstate Commerce Commission is directed to make a comprehensive investigation of freight rates in order to remove unreasonable, unjustly discriminatory, or preferential rates found to exist.

3. In making adjustments as a result of the general investigation, the Commission is directed to take into consideration, among other factors, "the general and comparative levels in market value of the various classes and kinds of commodities as indicated over a reasonable period of years."

4. The Commission is specifically directed, in view of the existing depression in agriculture, "to effect with the least practicable delay such lawful changes in the rate structure of the country as will promote the freedom of movement by common carriers of the products of agriculture affected by that depression, including live stock, at the lowest possible lawful rates compatible with the maintenance of adequate transportation service."

5. Pending rate cases shall be decided in conformity with the resolution. This provision is designed to make the resolu-

¹ Public Resolution No. 46, 68th Congress. *United States Statutes at Large*, Vol. 43, part 1, pp. 801-802.

² Moreover, to what extent lower freight rates

would, as a matter of fact, actually improve the farmers' economic position is a debatable question outside the scope of the present article. An assured answer cannot be given without careful study of the economic aspects of the problem.

tion immediately effective and insure results prior to the completion of the investigation called for.

The "True Policy" of Rate Regulation

The resolution appears to bring into sharpest contrast the conflict between the value-of-service and cost-of-service principles of rate making. On the surface it seems as though Congress were attempting to induce the Commission to give exclusive weight to the value-of-service principle. On the other hand, certain qualifying phrases in the resolution, which, as we shall see later, have been seized upon by the Commission, suggest a narrower interpretation. Unquestionably, however, the resolution represents an attempt to legislate indirectly the giving of greater weight to the value-of-service principle than the Commission has seen fit to do in the past.

Two closely allied principles of rate regulation are given prominence by the Hoch-Smith Resolution: (1) The conditions which at any given time prevail in our industries shall be considered to the end that commodities may freely move. The phrase, "conditions which at any given time prevail," has reference, of course, to conditions of prosperity or depression. (2) General and comparative levels in the market value of commodities over a period of years shall be considered in making rate adjustments.

Does adherence to these principles represent a new policy in rate regulation?

The second of the principles mentioned above does not require comment. The principle of adjusting rates according to the value of the commodity is too well known to need elaboration here. This principle has long been recognized by the Interstate Commerce Commis-

sion, but has never been considered as a controlling factor. Value is but one of many factors which have received consideration. The Hoch-Smith Resolution does not alter this. Value is merely enumerated as one matter to be considered in revising the rate structure. Perhaps the resolution will cause the Commission to give greater weight to the matter of value than it has hitherto done, but it cannot be said that anything new in principle has been added by including this provision in the Hoch-Smith Resolution.

The other principle which is given prominence in the Hoch-Smith Resolution—that of privileged treatment of distressed shippers—seems to be a complete departure from the policy heretofore followed by the Interstate Commerce Commission. Many instances can be found in which the Commission has definitely refused to base rates upon the financial condition of shippers. Thus in *Railroad Commissioners of Montana v. Butte, Anaconda and Pacific Railway Company*, the Commission said: "the inability of producers to realize profits under depressed market conditions will not of itself suffice to show that rates are unjust or unreasonable."³ The same principle was discussed at greater length in *Railroad Commissioners of Kansas v. Atchison, Topeka and Santa Fe Railway Company*:

This Commission has often said that it cannot require of carriers the establishment of rates which will guarantee to a shipper the profitable conduct of his business. The railway may not impose an unreasonable transportation charge merely because the business of the shipper is so profitable that he can pay it; nor, conversely, can the shipper demand that an unreasonably low charge shall be accorded him simply because the profits of his business have shrunk to a point where they are no longer sufficient.

The effect of a rate upon commercial con-

³ 31 I.C.C. 641, 642 (1914).

ditions, whether an industry can exist under particular rates or a particular adjustment of rates, are matters of consequence, and facts tending to show these circumstances and conditions are always pertinent. But they are only a single factor in determining the fundamental question. A narrowing market, increased cost of production, overproduction, and many other considerations may render an industry unprofitable, without showing the freight rate to be unreasonable.⁴

These cases and many others of like nature are quoted in support of the contention that rates should not be based upon the financial condition of the industry. For the most part, however, these cases were concerned with complaints of individual shippers or groups of shippers disadvantageously located with respect to a market. Such producers were demanding rates which would enable them to compete with producers more advantageously situated. But when practically all important rates upon a certain commodity are involved, a somewhat different issue arises. Then the question is, not the financial condition of individual shippers or groups of shippers, but the distress of an industry as a whole.

Nevertheless, there are instances in which the unprofitableness of an entire industry has been urged without success as the basis for determining reasonable rates. Thus in *Florida Fruit and Vegetable Association v. Atlantic Coast Line Railroad*, the rates on pineapples were in question. To the contention of the growers that such rates should be established as would permit them to market their product at a reasonable profit the Commission replied, "No such test of the justness of a transportation charge can be admitted."⁵ The following statement of the Commission in *Advances in Rates—Western Case* is applicable to either type of case in which this question has been raised:

To make rates for transportation based solely upon the ability of the shipper to pay those rates is to make the charge for transportation depend upon the cost of production rather than the cost of carriage This necessarily gives to the carrier the right to measure the amount of profit which the shipper may make and fix its rates upon the traffic manager's judgment as to what profit will be permitted.⁶

It was not until after 1920 that the policy of refusing to base rates on the financial condition of an industry as a whole was applied extensively to large and important industries. The agricultural depression and the slump in the prices of farm products created the circumstances under which the issue was brought to the front. The farmers were seeking lower freight rates. Their claims were based in large measure upon the depressed condition of agriculture. Although some decreases in rates were secured, the agricultural interests felt that further reductions were justified. The Commission, however, refused to require further decreases and definitely rejected the idea that reductions could properly be made on the basis of the financial conditions prevailing in the industry. The most that the Commission would concede was that financial conditions might be considered with other factors as relevant to the value of the service to the shipper. In *National Live Stock Shippers' League v. Atchison, Topeka and Santa Fe Railway Company*, the Commission pointed out that the live stock interests contended that rates should be reduced below what would be justified by standards formerly recognized because the industry was not in a prosperous condition. The Commission answered this argument: "If that be true, then the converse must be

⁴ 22 I.C.C. 407, 410 (1912).

⁵ 17 I.C.C. 552, 560 (1910).

⁶ 20 I.C.C. 307, 350-351 (1911).

true, that at times when the industry prospers we may find justified rates higher than those which under accepted standards would be just and reasonable."⁷ After further discussion of this question, the Commission said: "We therefore restate that, in considering the reasonableness of rates, industrial prosperity or adversity may be taken into account, with other factors, but cannot dominate them."⁸ The same question was discussed in *Rates and Charges on Grain and Grain Products*, wherein the Commission said:

In considering the reasonableness of rates, the economic condition of an industry may be relevant as it bears on the value of the service to the industry and as it may permanently or for a long period of time affect the ability of that industry to pay the rates assessed, but taken by itself it cannot be accepted as controlling.⁹

It is clear that the agricultural interests were unsuccessful in their attempts to get lower freight rates on the basis of the depressed condition of the industry. But the doctrine rejected by the Commission in these cases has become the "true policy" of rate regulation by the terms of the Hoch-Smith Resolution. However, it will be shown in subsequent paragraphs that the operation of the "true policy" is hedged about in practice by so many other considerations that the reversal of policy will not result in such radical changes in rates as might be expected.

It is interesting to note that individual members of the Commission severely criticized the principle involved in the Hoch-Smith Resolution not long before that resolution was favorably acted upon by Congress. In a dissenting opinion in *Rates and Charges on Grain and Grain Products*, Commissioner Eastman said:

This brings us to a theory which has gained great vogue of late, namely, that the rates on

grain and other so-called basic commodities can and should be reduced at the expense of rates on other commodities of less basic importance and of higher value. This theory has been accepted by so conservative a body of business men as the United States Chamber of Commerce and has become a part of the platform creed of both of the great political parties. It has the advantage of being a theory under which it is possible to be for the railroads and for the farmers at one and the same time.

. . . Such knowledge of the railroad rate structure as I have does not inspire me with confidence in the practicability of this theory; but it is quite possible that I am too near to the subject for proper perspective and overimpressed with its complexities and difficulties.¹⁰

In the same case Commissioner Lewis expressed himself in stronger language. "I do not advocate the determination of this or other cases solely on the basis of bad economic conditions," he says. "The adoption of such a principle would lead to demoralizing instability of rates." And to reduce rates on such a plea, he adds, "would be equivalent to using the railroads and their owners as agencies for relief, or even for charity."¹¹

Interpretation of the Resolution

A great deal of confusion and uncertainty as to the exact meaning and significance of the resolution prevailed for some time after its adoption. Was the resolution a mere gesture in behalf of the farmer, or did it represent a radical change in our regulatory policy? It was even suggested that the Hoch-Smith Resolution would place rate regulation entirely upon the basis of the value-of-service principle. The justification for this idea is found, of course, in the em-

⁷ 63 I.C.C. 107, 116 (1921).

⁸ *Ibid.*, p. 117.

⁹ 91 I.C.C. 105, 143 (1924).

¹⁰ 91 I.C.C. 105, 176 (1924).

¹¹ *Ibid.*, p. 182.

phasis which the resolution places upon the relative value of commodities and upon conditions of prosperity or depression in industries. Furthermore, is not the pronouncement that rates should be adjusted so "that commodities may freely move" merely another way of saying "what the traffic will bear"?

The principal difficulty with this extreme interpretation of the Hoch-Smith Resolution is that it ignores constitutional limitations upon the exercise of the rate making power. Whether or not rates are confiscatory is primarily a question of costs, not of value of service or the ability of traffic to move freely. Rates made solely for the purpose of enabling traffic to move might be confiscatory. The regulatory body must inquire into the question of costs to the extent of avoiding confiscation, and no resolution of Congress can relieve the Commission of such an obligation. It follows, therefore, that the Hoch-Smith Resolution cannot be construed as placing rate regulation solely upon the basis of what the traffic will bear to the exclusion of cost factors.

This restriction upon the principle of the Hoch-Smith Resolution will substantially limit the relief that can be granted the farmer through a readjustment of freight rates. This is brought out in *American National Live Stock Association v. Atchison, Topeka and Santa Fe Railway Company*. Shippers were demanding a restoration of the prewar rates. They maintained that such rates were not confiscatory but would yield the carriers a substantial profit above the cost of handling the traffic. "Apparently," the Commission said, "complainants assume that in any such computation of profit only expenses directly attributable to the traffic need be considered and that live stock need not contribute to such maintenance-of-

way expenses as are occasioned by depreciation, decay, floods, or storms, or assist in defraying general expenses, taxes, or transportation expenses not incurred in a particular service." The Commission then went on to show that rates computed on such a basis might still be confiscatory:

In the past we have had occasion to consider at times what may be called "out-of-pocket" cost, but while it has been contended that the carriers might voluntarily, in certain situations, establish rates covering only such cost, it has never been seriously contended that we could lawfully require this to be done. Rates that we may lawfully require must in principle be high enough to cover all the cost that may fairly be allocated to the service plus at least some margin of profit.¹²

The Commission relied upon a definition of non-confiscatory rates established by the United State Supreme Court in *Northern Pacific Railway v. North Dakota*¹³ and followed in later cases.¹⁴

The Commission indicated a second limitation upon the principle of the Hoch-Smith Resolution in *Revenues in Western District*. In this case it was maintained by the agricultural interests that the Hoch-Smith Resolution would not permit the raising of rates on agricultural products unless these rates were confiscatory. In reply the Commission pointed out that the resolution requires the lowest lawful rates on farm products but that "while confiscatory rates are unlawful, it does not follow that all rates which escape confiscation are lawful." In fact, according to the Commission, the resolution has set no new standard of lawfulness. The lowest lawful rates required by the Hoch-

¹² 122 I.C.C. 609, 617 (1927).

¹³ 236 U.S. 585.

¹⁴ *Norfolk and Western Railway Company v. Conley*, 236 U.S. 605; *Banton v. Belt Line Railway Corporation*, 268 U.S. 413.

Smith Resolution are not necessarily rates which are just above the point of confiscation.

Still another limitation further restricting the boundaries within which rates may be adjusted upon the basis of prosperity and depression is afforded by the obvious intent of Congress, as expressed in the Hoch-Smith Resolution, to give full force and effect to the rule of rate making as found in section 15a of the Interstate Commerce Act. In *Revenues in Western District* it had been urged that the Hoch-Smith Resolution had the effect of repealing the rule of rate making. This contention was emphatically denied by the Commission. The Commission held that so important a provision of the law as the rule of rate making could not be considered repealed by inference. It is clear from the wording of the resolution that Congress was mindful of the revenues of the carriers. Thus the resolution in directing the Commission to investigate and revise existing rates specifically requires that due regard be given "to the maintenance of an adequate system of transportation." The resolution, furthermore, qualifies the requirement that the lowest possible lawful rates be granted on agricultural products by asserting that such rates should be "compatible with the maintenance of adequate transportation service."

Just how much leeway exists within which rates may be adjusted to favor agriculture has not been made clear by the Commission. In *Grain and Grain Products* we find the Commission saying: "... To the extent that there are flexible limits to our discretion, we shall require the maintenance of the lowest rates falling within those flexible limits."¹⁵ The following words, taken from the same case, serve only to emphasize that the flexible limits to the

Commission's discretion are narrowly restricted:

Rates that may lawfully be required must in principle be high enough to cover all of the cost that may fairly be allocated to the service plus at least some margin of profit. But it has always been recognized that the burden of transportation may reasonably be adjusted with some regard to the value of the service, in other words, that the higher-grade, more valuable commodities may be required to pay a greater margin of profit than those that are of lower grade and less valuable. The substance of the provision of the resolution quoted above is that agricultural products affected by depression shall in this respect be included in the class of most favored commodities, to such extent, at least, as may be "compatible with the maintenance of adequate transportation service."¹⁶

It does not seem possible that this interpretation of the resolution could cause much alarm to the railroads or give the farmer much hope of reduced rates.

Actual Results of the Hoch-Smith Resolution

In its practical operation the Hoch-Smith Resolution has not been without significant and perhaps far-reaching consequences notwithstanding the fact that the investigation called for by the resolution will not be completed for some time. The effects of the resolution, furthermore, have been greater than would at first seem possible in view of its conservative interpretation. In general, it may be said that although the resolution has caused, as yet, few reductions in rates on agricultural products, it has prevented important increases which might otherwise have been made.

To the time of writing there appears to have been but one important instance in which rate reductions were made as

¹⁵ 122 I.C.C. 235, 264 (1927).

¹⁶ *Ibid.*

a result of the Hoch-Smith Resolution. This was in *American National Live Stock Association v. Atchison, Topeka and Santa Fe Railway Company*.¹⁷ In this proceeding some reductions in the rates on live stock were secured by the live stock interests. In some respects this case was a peculiar one. The Commission found that the record did not warrant a finding that live stock rates in the West were in excess of reasonable maxima or in excess of the lowest possible rates compatible with the maintenance of adequate transportation service. The Commission, nevertheless, prescribed a distance scale of rates for live stock in part of the territory "for the purpose of removing existing discrepancies and in the light of the Hoch-Smith Resolution."¹⁸ The new scale of rates was somewhat lower than the existing one particularly for the shorter hauls, the latter being out of line with long haul rates. The existing discrepancies, however, were not found to result in undue prejudice or discrimination. In the words of Commissioner Hall, the Commission required the carriers "to do what no law requires them to do, and that is to reduce these lawful rates so as not to exceed prescribed maxima, which we do not find to be maximum reasonable rates."¹⁹

The first important case in which the influence of the Hoch-Smith Resolution can be seen was in *Revenues in Western District*, decided July 14, 1926. In this case the carriers in western territory proposed a horizontal increase of 5% in freight rates. A further increase of 15% was proposed for the area known as Western Trunk Line Territory, roughly comprising the region north of Oklahoma and Arkansas and east of the Rocky Mountains. The carriers clearly showed that they had not in any year since the Transportation

Act was passed earned the fair return contemplated by the statute. This fact was admitted by the Commission, and it seemed apparent that under the provisions of section 15a of the Interstate Commerce Act increases must be granted. The Commission, however, denied the increases. It was so difficult to reconcile this decision with the provisions of section 15a that the Commission's action was condemned by railroad spokesmen as a "nullification of laws it is charged with administering."²⁰

The explanation of the Commission's decision in this case is to be found in the Hoch-Smith Resolution. The carriers had proposed a general percentage increase in freight rates. Such an increase would result in raising the rates on agricultural products. But according to the Hoch-Smith Resolution, rates on agricultural products must be the lowest lawful rates. The Commission, therefore, informed the carriers that "in proposing changes in existing rate structures, either for the purpose of improving earnings of carriers in western trunk line territory or for the purpose of rectifying inequalities in existing rate structures, carriers should propose no advances in the rates on products of agriculture, including live stock, except where particular rates on such products may need adjustment to remove inconsistencies or where it can be shown that the product is not affected by depression."²¹ Although the Commission clearly said in this case that the Hoch-Smith Resolution did not render impossible the grant of relief by means of percentage increases in all rates, it stated that such relief could be granted

¹⁷ 122 I.C.C. 609 (1927).

¹⁸ *Ibid.*, pp. 629-630.

¹⁹ *Ibid.*, p. 635.

²⁰ *Railway Age*, Vol. 81, p. 183.

²¹ 113 I.C.C. 3, 39 (1926).

only upon a showing of the existence of an "emergency" and an "urgent necessity" for the increase. The Commission was not convinced of the existence of such an emergency and denied the relief requested. The Commission reconciled its action with the requirements of section 15a by saying that these provisions did not relieve the carriers from the duty of initiating suitable changes in rates to supply their revenue deficiencies.

The question of horizontal increases in rates was also mentioned in *Grain and Grain Products from, to, and between Illinois, Iowa, et cetera*.²² The carriers' usual method of securing additional revenue is to make horizontal increases in many or all rates, thereby avoiding the embarrassment of distinguishing between various kinds of traffic. But the Hoch-Smith Resolution has brought to the forefront this question of the distribution of the transportation burden among commodities. Apparently, the Hoch-Smith Resolution has made it more difficult for the carriers to secure increases through horizontal changes in rates, because this method involves increases in the rates on agricultural products which under the Hoch-Smith Resolution are to be given special consideration. Horizontal increases are also inconsistent with the emphasis which the Hoch-Smith Resolution puts upon the relative adjustment of the transportation burden as between the various commodities and classes of traffic. The use of percentage changes in all rates would seem to be reserved in the future for cases of "emergency" and "urgent necessity."

Another result of the emphasis which the Hoch-Smith Resolution places upon the relative adjustment of freight rates is brought out in *Grain and Grain Products from, to, and between Illinois,*

Iowa, et cetera. Certain railroads had proposed changes in rates, mainly increases, on grain and grain products. The carriers relied upon a showing that the rates proposed to be increased were low, and generally lower than the rates on grain from a large part of western territory, many of which had been fixed by the Commission itself. Ordinarily the facts presented would have justified the increases. In fact, the Commission admitted that the railroads had made out a strong case on the basis of comparisons. The Commission said that the existing rates were in general low and that the proposed rates were "not unduly high." It refused, however, to permit the proposed increases. As Commissioner Hall stated in a dissenting opinion, "The majority report leaves a clear impression that the proposed rates are justified under all standards except those set up by the Hoch-Smith Resolution."²³ The resolution, in other words, had injected this new element into the situation, namely, the relative burden of transportation charges. The Commission, therefore, in refusing to uphold the proposed rates criticized the carriers for not presenting other evidence: "No evidence was offered . . . with a view to showing that the earnings of the rates which they are seeking to increase are either intrinsically low, or low by comparison with the earnings derived from the rates on other commodities. No attempt was made to show the actual or the relative cost of service."²⁴ The action of the Commission in this case would suggest that simple rate comparisons are of less importance in rate cases than formerly, at least if the proposed rates involve agricultural products. The effect of this

²² 122 I.C.C. 235 (1927).

²³ 122 I.C.C. 235, 272 (1927).

²⁴ 122 I.C.C. 235, 265 (1927).

decision, if consistently adhered to, will be to increase the difficulties for carriers attempting to secure advances in the rates on agricultural products.

It should not be inferred from the cases just described that the Hoch-Smith Resolution has had the effect of preventing all increases in the rates on agricultural products. Thus in *Unmanufactured Tobacco from Kentucky to St. Louis* the Commission found justified increases in rates on tobacco from certain points in Kentucky to St. Louis. Parties opposed to the increase invoked the provisions of the Hoch-Smith Resolution. To this the Commission replied: "We do not understand that the Hoch-Smith Resolution is designed to perpetuate violations of the law or that it can be invoked to justify advantages heretofore given to tobacco producers of this section over nearby and competing tobacco producers."²⁵ In this connection, one decision under the Hoch-Smith Resolution, decided a few months prior to the tobacco case, does not seem consistent with the statement just quoted. The failure of the Commission to permit the increases proposed in *Grain and Grain Products from, to, and between Illinois, Iowa, et cetera*, resulted in the continuance of rates which were unduly preferential to shippers in Minnesota and unjustly prejudicial to shippers in North and South Dakota. The removal of the discrimination, however, was reserved until the more thorough investigation of the rate structure called for by the resolution should be completed.

Another point brought out by recent decisions is that the provisions of the resolution have not prevented the Commission from refusing to authorize rate reductions if there was reason to believe that the rate structure would be disrupted or the revenues of the carriers would be impaired. This point was

brought out in *Grain and Grain Products to Eastern Points*²⁶ and in *Grain and Grain Products from Kansas and Missouri to Gulf Ports*.²⁷ It is interesting to note that in both of the above cases the reductions were proposed by the railroads and not by farmers or shippers. Certain members of the Commission felt that the Commission was not giving force and effect to the Hoch-Smith Resolution in these cases. In the latter case, Commissioner Campbell pointed out that the proposed rates would not be below a reasonable minimum. In his opinion, therefore, the requirement in the Hoch-Smith Resolution that products of the soil be accorded "the lowest possible lawful rates" amply justified the proposed reduction. In the other case, Commissioner Campbell pointed out that the Commission had recently approved reduced rates on ex-lake iron ore from Chicago to Granite City which yielded less than 4 mills per ton-mile for a haul of only 275 miles, while the proposed rates on grain would yield 5 mills per ton-mile and more for hauls of 2,000 miles. "How is the farmer ever going to secure any relief as contemplated by the Hoch-Smith Resolution if we persistently withhold from him what are admitted to be reasonable minimum rates for fear that the probable effect, not of the immediate rates proposed but in some remote way other rates which might have to be similarly reduced to not less than a reasonable minimum level, would be to take away some revenue from the carriers?"²⁸ Commissioners Lewis and McManamy were also of the opinion that the re-

²⁵ 126 I.C.C. 93, 96 (1927).

²⁶ 122 I.C.C. 551 (1927).

²⁷ 115 I.C.C. 153 (1926).

²⁸ 122 I.C.C. 551, 570-571 (1927).

ductions were justified in view of the provisions of the Hoch-Smith Resolution.

A consideration of the cases in which the Hoch-Smith Resolution has been involved would seem to justify the following conclusions. The resolution has not brought about the reductions in rates on agricultural products which its proponents and supporters have desired. The Commission has interpreted the

resolution conservatively and has proceeded cautiously in applying it. The resolution, however, put added difficulties in the way of securing increases in the rates on agricultural products. It has prevented certain advances in rates that would otherwise have been made. Thus the farmer has received some benefit from the resolution, while the carriers have been correspondingly embarrassed.

LAND CREDIT IN THE TOWN OF NEWTON, MANITOWOC COUNTY, WISCONSIN,

1848-1926

By DAVID ROZMAN

DISCUSSIONS of land tenure have largely centered around tenancy. Very little has been said about the "hired man" or the "encumbered owner" stage of the "agricultural ladder." What has been said about the latter has largely centered on the subject of mortgages. Since 1890 the United States Census has presented some facts about farm mortgages, and the general increase in the number of farms mortgaged.

This increase in the burden of debt has often been deplored. But the mortgage may mean many things. It may indicate a situation of distress if the farmer has to mortgage his farm in a financial crisis. The final step may be bankruptcy and the operator may be reduced to the status of a tenant. The increase in the number of mortgages in our western states during the past five years is undoubtedly explained in this manner.

On the other hand, the mortgage may indicate a perfectly normal condition of enlarging the productive capacity of the farm by providing capital for new buildings, live-stock, and equipment. The Federal Farm Loan Act illustrates this type of credit for "productive purposes."

Far more frequently, however, the mortgage means a step upward on the agricultural ladder. It means that the farmer has paid enough of the purchase price of the land to be classed as the owner and has thereby raised himself out of the tenant class. It is a note-

worthy fact that the states with a low percentage of tenancy are among the highest in the percentage of mortgaged farms, although the correlation does not exist in every case.

Theoretically, an aspiring tenant has two alternatives—to remain a tenant until he has accumulated enough money to pay cash for a farm, or to borrow money and buy his farm outright, hoping to pay off the loan out of the proceeds of the business. Under the first condition, the period of tenancy would be long and the proportion of rented farms high, but there would be no mortgages except those for improvements or those indicating distress. In the second case, there would be few tenants, but the proportion of encumbered farms would be exceedingly high. It is impossible to have both a low percentage of tenancy and a low percentage of mortgaged farms except under unusual conditions.

A farmer must compare the relative merits of these two stages in his effort to attain the ownership of an unencumbered farm wherever circumstances permit a choice. The mortgaged owner who is saddled with a heavy debt is often worse off than a tenant. Some men take this step too soon and pay too high a price for the privilege of being called a landowner.

Proper credit facilities may make the acquisition of landownership comparatively easy and may even eliminate the tenant step altogether. Denmark has reduced the percentage of tenant-oper-

ated farms to about 10% by lending government funds to farmers. Of special importance is the Act of 1899 under which the Danish government, under certain conditions, lent 90% of the value of the farm including buildings and stock. The terms of repayment were made very easy. As amended, no payments except interest were required during the first five years. Interest was at 3%, and after the five years the debt was gradually amortized. Naturally, such a policy increases the number of mortgages and the amount of indebtedness, but the burden is comparatively light.

Of special interest, therefore, is a region where tenancy is non-existent. The purpose of the study in the town of Newton in Manitowoc County, Wisconsin, was to secure data on the land credit of this area and to see what role it has played in the agricultural ladder. In this article, credit conditions as revealed by an examination of the mortgages will be emphasized. In Wisconsin mortgages are recorded with the Register of Deeds in each county and are registered in special volumes designated for this purpose. When the mortgage is satisfied, record is made of this fact, usually by stamping the date of satisfaction and other facts upon the original record of the document.

In order to obtain a complete picture of land credit, the investigators obtained all available data on every mortgage that has been recorded for this township from the first one in 1848 to the last on September 1, 1926. It is not claimed that these data give a complete picture of the credit situation. The law does not effectively compel the recording of every mortgage, although failure to register the document or its satisfaction may involve the parties to the contract in considerable difficulties.

Not all recorded mortgages are indexed, nor are all land credit transactions covered by mortgages. In the early days it was customary to demand mortgages for even small loans: some were less than \$50, whereas at the present time banks are lending \$500 to \$1,000 on the personal notes of farmers. Many of these loans are really land credit just as truly as the mortgages.

Mortgages accompanying bonds of maintenance were also omitted. These bonds are drawn up when parents transfer their farms to the children. At such times three documents are executed; a deed conveying the farm to the son, a bond of maintenance stipulating the conditions which must be fulfilled before the deed becomes valid, and a mortgage backing up the bond. The bond usually specifies the rooms to be reserved for the parents in the farmhouse, the food, fuel, conveyances, and so on, that the son must give them, and what sums shall be paid to the other heirs and to the parents. Most of the bonds go into considerable detail on these points. About 160 of these documents are on record.

The reason for omitting these from the study is that the sum stated in the mortgage is merely a guaranty; the real burden of debt is represented in the money actually paid to the other heirs and parents and in the services rendered to them. These amounts cannot be exactly ascertained. Moreover, the satisfaction was neglected in so many cases that the length of time of the encumbrance could not be judged with accuracy.

Not all mortgage records had all the desired data. Very often the most valuable facts were stated in a note accompanying the mortgage, but the note itself was not on record. How-

ever, the following facts were made available by the records: the amount borrowed, the period for which the debt was to run, the rate of interest paid, the acreage mortgaged (usually described in full in the document), and the names and places of residence of the mortgagor and mortgagee.

The Settlement of the Township

The township of Newton is located in Manitowoc County, a few miles southwest of the county seat. It is the usual congressional township of 36 square miles, but Lake Michigan occupies part of the southeastern sections so that its actual land area as reported by the government surveyors is only 22,068 acres. The town lies in the glaciated section of Wisconsin and has many small lakes, one of which is meandered and its area excluded from the total acreage mentioned above. The northern and northwestern parts are rather hilly. Much of the land is heavy red clay, but along Lake Michigan there is a strip of light sandy soil. Originally, the land was covered with maple, beech, and pine forests including some other species, especially cedar and tamarack in the swamps. Prairies or openings were entirely absent, so the settlers were confronted with the arduous task of clearing the land.

The first land entries were made in 1836, being part of the speculation in land that raged all along the Lake shore from Chicago to Green Bay. After the panic of 1837 settlement practically ceased and land entries were not resumed until 1847. Within three years most of the land, with the exception of the school section, the swamp land, and several scattered tracts, were in private hands. The last entry was made in 1858. Many of the entries were

made by non-residents who sold the land to actual settlers a few years later. Several of these speculators owned tracts of considerable size. By 1860 practically all of the township was in the possession of settlers, but the process of farm making extended well up to 1880.

Although the majority of the entries were made by Yankees, or native Americans, in 1860 only two heads of families were not of foreign stock. Most of the settlers were Germans, but there was a settlement of Poles in the southeastern part and another settlement of Irish in the southwestern section, the latter extending into neighboring townships. These three nationalities are to be found in Newton today in practically the same geographical location.¹

The most significant characteristic of the population of this area is its stability. According to the *Wisconsin Domesday Book*² in 1903, 82 names of landowners were found to be identical with names on the map of owners in 1860. Inasmuch as the census of 1860 listed 228 farmers, this indicates a high degree of stability. However, a comparison of names does not reveal all the cases of inheritance because some of the farms were inherited by daughters. A comparison of names for the years 1880 and 1903 reveals a still larger number of identities, namely, 140. In one section one-half the farms are in possession of direct descendants of the first settlers. Where this is the case, only three generations have operated the farms since the first settler came into possession.

¹ The contrast between the activities and choice of land of the Yankee and the foreign stocks is well treated by Joseph Schafer, "The Yankee and the Teuton in Wisconsin," *The Wisconsin Magazine of History*, December, 1922, and March, 1923.

² Published by the Wisconsin Historical Society.

This stability has produced a homogeneous community where the ties of friendship have been strengthened by intermarriage, although this has taken place more or less within racial lines. In such a closely knit community the "credit-worthiness" of an individual was known to all. All this helped to develop the kind of credit institutions and conditions peculiar to the area.

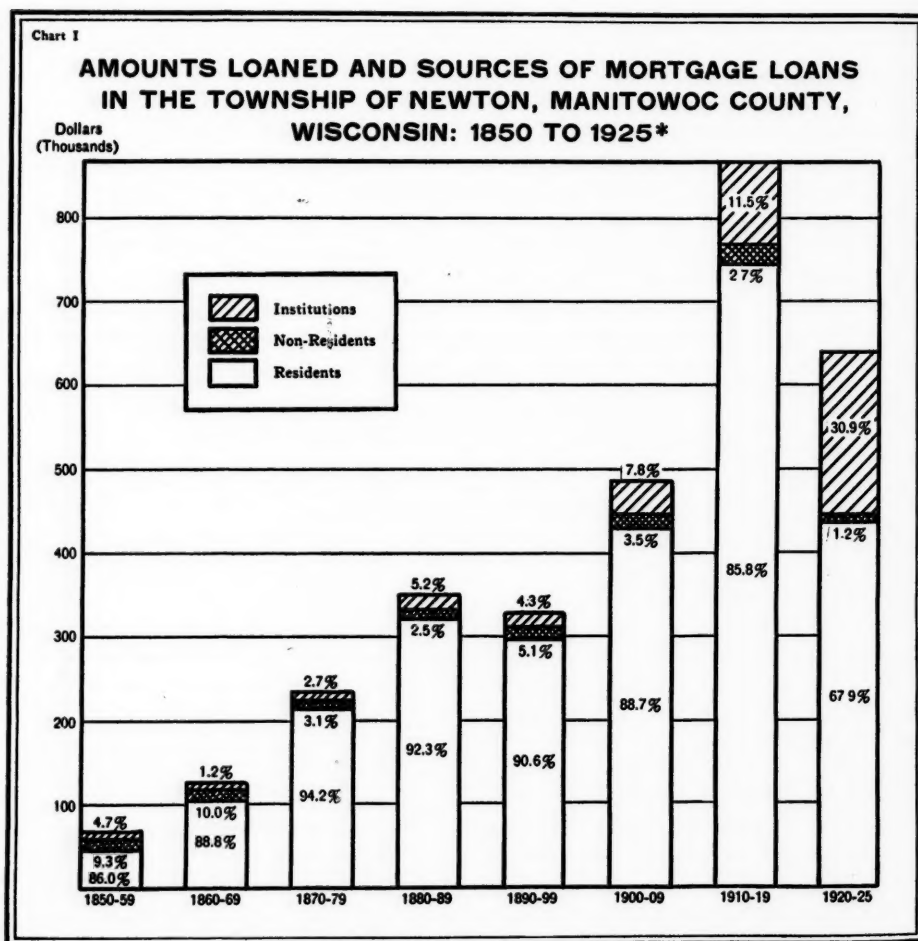
Sources of Mortgage Loans

For a period of about 80 years the

source of land credit has been principally the individuals living in the township itself, farmers, merchants, and small business men.³ Eighty-five per cent of all the loans have been made by actual residents. Chart I shows the amount of money lent on farm mortgages for each census decade and for the years 1920 to 1925.⁴ The sources

³ The town has no incorporated villages. There are a few hamlets of less than 15 houses, stores, churches, schools, garages, and other buildings.

⁴ Mortgages given in 1848 and 1849 have been included in the 1850-1859 decade.



of mortgage credit are classified as resident and non-resident individuals, and "institutions." Many of those classed as non-resident are in reality neighbors of the mortgagors because they live in neighboring townships, often just across the boundary line of the town.

Non-resident individuals furnished about 10% of the loans during the first two decades, but after that their proportion rarely rose above 3%, the highest being 5.1% in the decade 1890-1899. The reason for the comparatively large number of non-resident loans in the early years was the mortgaging of the land by the "speculators." In one case a resident of Connecticut mortgaged his land in Newton to a man living in Ohio, but the mortgage was recorded at Manitowoc. Probably neither of them had ever seen the land. Several of the larger landowners were Easterners who sold their land through agents. Whenever they sold the land

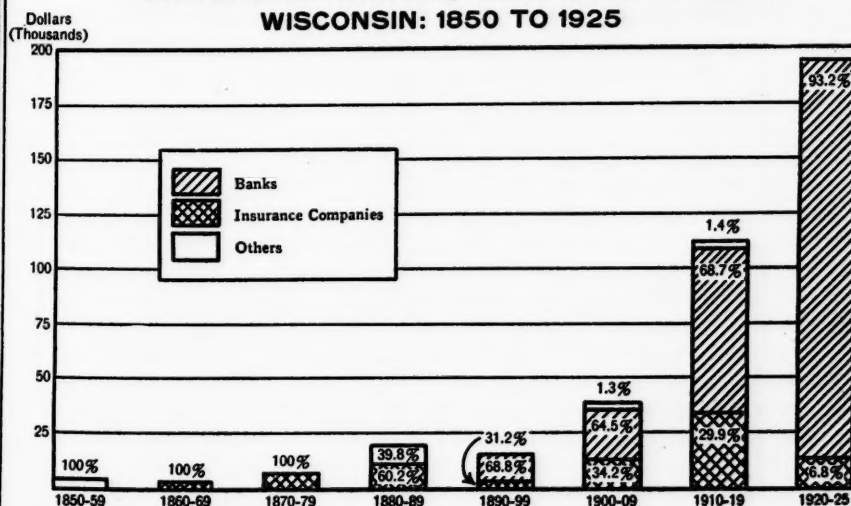
to *bona fide* settlers, they usually accepted a mortgage for part of the purchase money. Naturally, such men would be grouped with the non-resident mortgagees.

The fact that so large a part of the land credit has been furnished by residents of the town or by local people indicates two things. First, the settlers of this area were not all poor people; many came with some means and there was loanable capital from the very beginning. Second, the conservative type of agriculture and the thriftiness of the people have made capital accumulation possible. In fact, all of eastern Wisconsin has been noted as a capital-exporting area.⁵

⁵ Hibbard and Robotka, "Farm Credit in Wisconsin," Wisconsin Agricultural Experiment Station *Bulletin No. 247*, compare Dane and Douglas counties of Wisconsin, one an old county like Manitowoc, the other new with little local capital and dependent upon outside sources for farm credit.

Chart II

MORTGAGE LOANS FROM OTHER THAN INDIVIDUALS IN THE TOWNSHIP OF NEWTON, MANITOWOC COUNTY, WISCONSIN: 1850 TO 1925



But a third factor is still more important, that is, a mortgage may call for little actual transfer of money. When a farm passes to the next generation by inheritance, a mortgage may be recorded but it represents merely an obligation or a guaranty and no transfer of money. Even if the farm is transferred to a stranger, he may pay part of the purchase price in cash and give a mortgage for the rest. Again no loan in the usual sense of the word is involved. Only when *A* sells the farm to *B* and *B* borrows the money from *C* in order to pay *A* does the mortgage call for a transfer of money. However, the mortgage will be between *B* and *C* and not between buyer and seller.

Of course, most mortgages made for the purpose of increasing the farmer's capital, for new buildings and equipment, call for a transfer of funds, but even in these cases the lumber dealer or the machinery agent may be the mortgagee, and no transfer of funds takes place. Just what proportion of the loans involved the actual transfer of money cannot be ascertained until every transaction is studied in detail.

Since so much of the lending of money has been between friends and relatives, many of the mortgages given in Newton are not commercial transactions in the usual sense. This has also affected the rate of interest, as will be noted later. The sinister aspect of the mortgage as portrayed in popular literature or as it manifested itself in Kansas and other western states was unknown in this township.

The third division of creditors has been grouped under "institutions" and consists chiefly of banks, insurance companies, and a few others. These were of little consequence for the first 50 years, but in the last two decades they have grown steadily in importance as

sources of mortgage credit. Chart II shows that in the earlier decades private companies, other than banks and insurance companies, were the sole source of "institution" credit. In the next two decades practically all of this type of credit was furnished by the Newton Mutual Fire Insurance Company, a local organization said to be the oldest company of its kind in Wisconsin. In the decade from 1880 to 1889 it supplied over 60% of all loans not made by individuals. Banks, as a source of credit, appeared for the first time in the nineties and grew rapidly in importance until in the six years from 1920 to 1925, inclusive, they furnished 93.2% of the "institution credit" while the rest of the loans came from insurance companies, the Newton Mutual Company still furnishing the bulk of the loans.⁶

The growing importance of banks and other institutions as sources of credit indicates a tendency for the agriculture of the section to become more commercial and for credit to become less of a neighborhood or family affair. According to the testimony of some of the farmers, the whole aspect of rural life of the town is changing in the same direction. In the past there were several threshing rings, much interchange of work at harvest, barn "raisings," shingling bees, and similar types of community work. The tendency now is to hire labor for such tasks or to charge for work not strictly compensated for by work done in return. During the last 10 years many outsiders have moved into the township and this has helped to "commercialize" the method of land transfer and of community life.

⁶ The banks are located in Manitowoc city and the small towns. One bank in the town itself, located at the railroad station, was organized in 1921.

Mortgage Rate of Interest

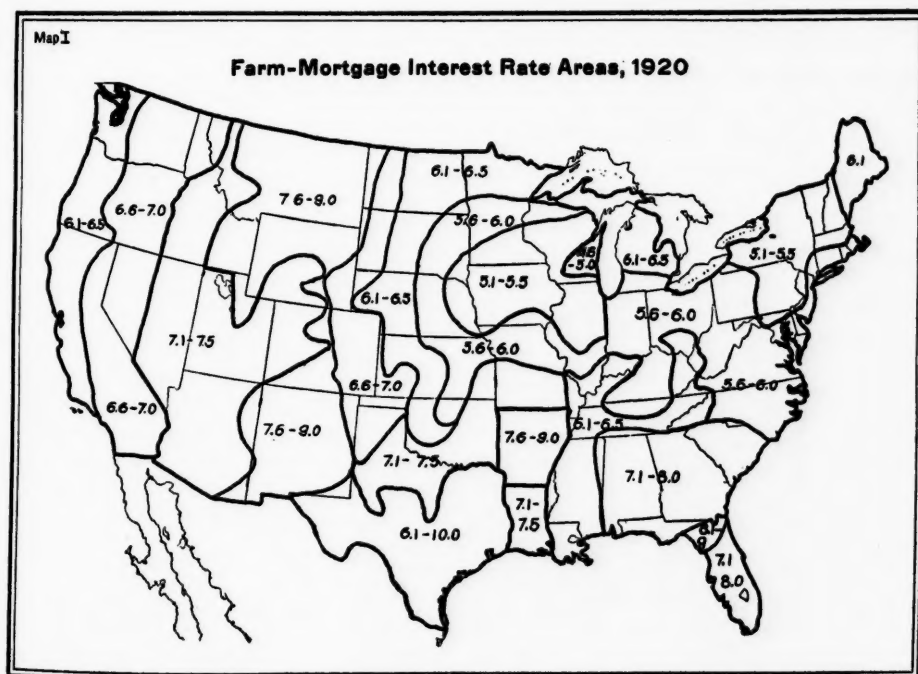
It will be noted from Map I¹ that Newton lies in the lowest farm mortgage interest rate area in the United States. In 1920 the rate in this section ranged from 4.6% to 5%. No other area enjoys such low mortgage interest. This results from the availability of local capital and the desire of lenders to place their loans on farm land near at hand. As a rule, outside avenues of investment are not generally known or available to farmers and they prefer to lend at a lower rate to neighbors than to strangers or to distant places which involve risks and uncertainties.

The kind of agriculture practiced in this region involves few credit risks.

¹First published in Clara F. Wigder's article, "Farm Mortgage Interest Rates," *Journal of Land and Public Utility Economics*, January, 1925, p. 106.

From the very beginning the farmers have diversified their operations; wheat, rye, oats, barley, peas, and potatoes were enumerated in the census of 1860. With the exception of an emphasis on wheat during the wheat-growing era and later a few years of extensive growing of canning peas, this general balance has not been broken. Dairying was introduced very early and is now the predominant farm enterprise. A regular income is thus assured through the milk check and the sale of hay, cereals, eggs, poultry, hogs, and other farm animals.

The low interest rate has its effect on the amount of tenancy. If money can be borrowed at rates of 3½% and 4%, as has been the case in Newton, it is easier to buy a farm than to rent one, especially in a region where renting is uncommon and where no standard leases have been established. How-



ever, it is difficult to establish this relationship completely because so many other factors also contribute to the tenure system of this area.

The historical trend in interest rates is very interesting and is graphically shown on Chart III. The interest rate was mentioned in 1,439 mortgages of a total of 2,296 examined. The earlier mortgage records usually contained much fuller information on this point than the later ones. Up to 1880 about 85% of the mortgages stated the interest rate; after 1890 not more than one-half did so; in fact, from 1900 to 1909 in only 12% of the recorded mortgages was the interest rate mentioned. However, enough cases are available for each decade to trace the trend.

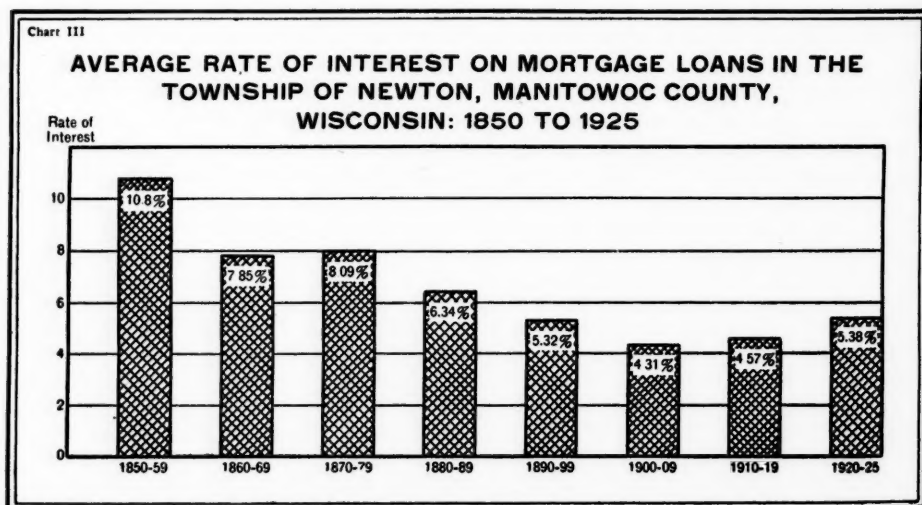
It will be seen from Chart III that the average rate of interest in the decade 1850-1859, was 10.8%. The variations for the separate years within the decade were not large, being 12% for 1850 and 10.47% in 1859. The range between the highest and lowest rate charged for individual mortgages lay between 24% and 5%, but in only

one case was the former rate charged and there are only a few instances of the latter rate. This reflects the pioneer conditions of the times. Many of these mortgages were for part of the purchase money and ran for only a few months but at high rates of interest.

In the next two decades the farms were in the process of development. The interest rate began to decline, averaging 7.85% for 1860-1869 and, curiously enough, a trifle higher in the next 10 years, namely, 8.09%. The lowest annual average rate was for 1865 and the highest in 1870.

The next three decades witnessed a consistent decline in the rates of interest on mortgage loans. The lowest rate is found in the decade 1900-1909, averaging only 4.31% for the 10 years. Individual mortgages were written as low as 3.5%. The rate rose slightly in the war decade to 4.5%, particularly on account of the higher rates charged during 1918 and 1919. But for the first 20 years of the present century the average interest rate was approximately 4.5%.

During the next six years the rate



went up to an average of 5.38%. This tendency coincides with the decline in borrowing from local sources and the increase of commercial types of credit. Naturally, the general post-war conditions in agriculture also affected the interest rate.

Length of Time for Which Mortgages Were in Force

Mortgages usually stated the time for which the loan was expected to run, but this corresponded to the actual duration of the loan in only a few cases. By noting the date when the mortgage was given and when it was satisfied, the actual duration was obtained. However, in about 4% of the cases the satisfaction was not recorded. This was caused by carelessness in some cases but in other cases the land was sold to the creditors, or at sheriff's sale, or was repossessed by the former owner, in which event the new deed took the place of the usual satisfaction. Since it was not possible to check up every case, the investigators assumed that the average duration of the other mortgages for any decade could be applied with a fair degree of accuracy to those mortgages for which no satisfaction was recorded.

The results obtained in this way are given by five-year periods in Table I. The table was not carried beyond 1914 because many of the mortgages given thereafter, and even some given in the years preceding 1914 are still in force. It will be noted that the average duration of mortgages does not fluctuate greatly from one period to another. The shortest duration occurred in the quinquennium beginning in 1860, when it was only four years; the longest happened during 1890-1894 when it was 6 $\frac{3}{4}$ years. For the entire period

since 1850, the average duration was 5 $\frac{1}{3}$ years.

However, the data are deficient in two respects. Many mortgages are canceled by partial payments; sometimes the amounts and the date of payment are specified in the document itself, but the times and amounts of actual repayments are not recorded as a rule. The mortgage is considered satisfied when the last payment has been made, but this gives the impression that the farm carried the full burden of debt for the whole time. On the other hand, the mortgage might have been renewed or else the farmer borrowed from Peter to pay Paul. In all these cases the duration of mortgages gives no clew to the total length of time the farm carried a mortgage debt. Sometimes Paul was repaid within a few months after the mortgage was given because Peter would lend for $\frac{1}{4}$ or $\frac{1}{2}$ % less than Paul, but there may have been other reasons for changing mortgages. Also this renewal or transfer was frequently for a smaller sum, indicating that part of the principal was paid in the process. A further study is being planned to determine how

TABLE I. AVERAGE DURATION OF MORTGAGES IN NEWTON TOWNSHIP, 1850-1914

| YEARS OF CONTRACTION | AVERAGE DURATION | |
|---|------------------|--------|
| | Years | Months |
| 1850-1854..... | 4 | 5 |
| 1855-1859..... | 5 | 5 |
| 1860-1864..... | 4 | 0 |
| 1865-1869..... | 4 | 8 |
| 1870-1874..... | 5 | 0 |
| 1875-1879..... | 4 | 10 |
| 1880-1884..... | 5 | 1 |
| 1885-1889..... | 6 | 0 |
| 1890-1894..... | 6 | 9 |
| 1895-1899..... | 5 | 7 |
| 1900-1904..... | 5 | 7 |
| 1905-1909..... | 5 | 6 |
| 1910-1914..... | 5 | 7 |
| Average duration for entire period..... | 5 | 4 |

long each farm actually carried a burden of debt.

Annual Mortgage Encumbrance

The first mortgages were given in 1848, when three were recorded. In the next year only one farm was mortgaged, but in 1850 the number rose to 10. Table II shows that the total number of mortgages for the decade, 1850-1859, was 261. Only a few more were given during the Civil War period, and the largest number for any one decade was registered in 1870-1879, namely, 374; the smallest number, 258, in 1900-1909. It is an interesting fact that since 1890, especially, there has been no great fluctuation in the number of mortgages given by the farmers of Newton from decade to decade. Part of the decrease in the number of mortgages is probably due to the fact that farmers may now borrow fairly large sums on their personal notes, whereas a mortgage was demanded in the earlier days even for small sums.

The acreage mortgaged is another way of judging mortgage indebtedness. It is not the same as the number of farms mortgaged, as reported in the census, because farms are not uniform in size and the mortgage does not necessarily cover the whole farm. In other

TABLE III. PERCENTAGE OF LAND MORTGAGED IN NEWTON, IN WISCONSIN, AND IN THE UNITED STATES

| Year | Newton: % of Acreage | Wis.: % of Owned Farms* | U. S.: % of Owned Farms* |
|------|----------------------|-------------------------|--------------------------|
| 1850 | 5.08% | ..... | ..... |
| 1860 | 31.58 | ..... | ..... |
| 1870 | 34.64 | ..... | ..... |
| 1880 | 49.73 | ..... | ..... |
| 1890 | 51.56 | 42.9 | 28.2 |
| 1900 | 51.62 | 45.8 | 31.1 |
| 1910 | 52.76 | 51.4 | 33.6 |
| 1920 | 52.28 | 62.0 | 41.3 |
| 1925 | 50.01 | 55.9 | 35.9 |

* Beginning with the Census of 1910 the mortgage debt inquiries applied to all farms operated by their owners, while at the two preceding censuses they applied only to the smaller class of farm homes occupied by their owners. Since, however, nearly all farms which are operated by their owners are also occupied by them as homes, this slight difference in the basis of the statistics has virtually no effect on the comparability of the figures. (From the *Fourteenth Census of the U. S.*, Vol. V, 1920.)

cases, there are second and third mortgages on one farm. Table II shows the number of acres that were mortgaged each year, averaged by decades. It will be noted that there is a rough correlation between the number of mortgages and the acreage mortgaged annually, except for the last six years. In this period 169 mortgages covered 2,053 acres, whereas in 1880-1889, 361 mortgages involved a slightly larger area. However, a relative stability is noticeable in the number of mortgages and the area mortgaged.

Compared with the relative stability in the number of mortgages and acreage mortgaged annually, the values involved show a gradual increase. Only in the decade from 1890-1899 was there a decline from the figure for the previous decade. The average amount borrowed annually during the first decade was \$6,258; this was almost doubled in the next period and practically doubled again in the following decade. The next period of marked increase came after 1900 and particularly in the six years after the World War, 1920-1925.

TABLE II. ANNUAL MORTGAGE ENCUMBRANCE IN NEWTON TOWNSHIP, 1850-1925

| Years | Number of Mortgages per Decade | Average Acreage Mortgaged Each Year | Average Amount Borrowed per Annum |
|-----------|--------------------------------|-------------------------------------|-----------------------------------|
| 1850-1859 | 261 | 1,755 | \$ 6,258 |
| 1860-1869 | 291 | 1,413 | 11,888 |
| 1870-1879 | 374 | 1,826 | 22,764 |
| 1880-1889 | 361 | 2,219 | 35,020 |
| 1890-1899 | 290 | 1,763 | 32,631 |
| 1900-1909 | 258 | 1,732 | 48,293 |
| 1910-1919 | 290 | 2,033 | 87,214 |
| 1920-1925 | 169 | 2,053 | 106,638 |

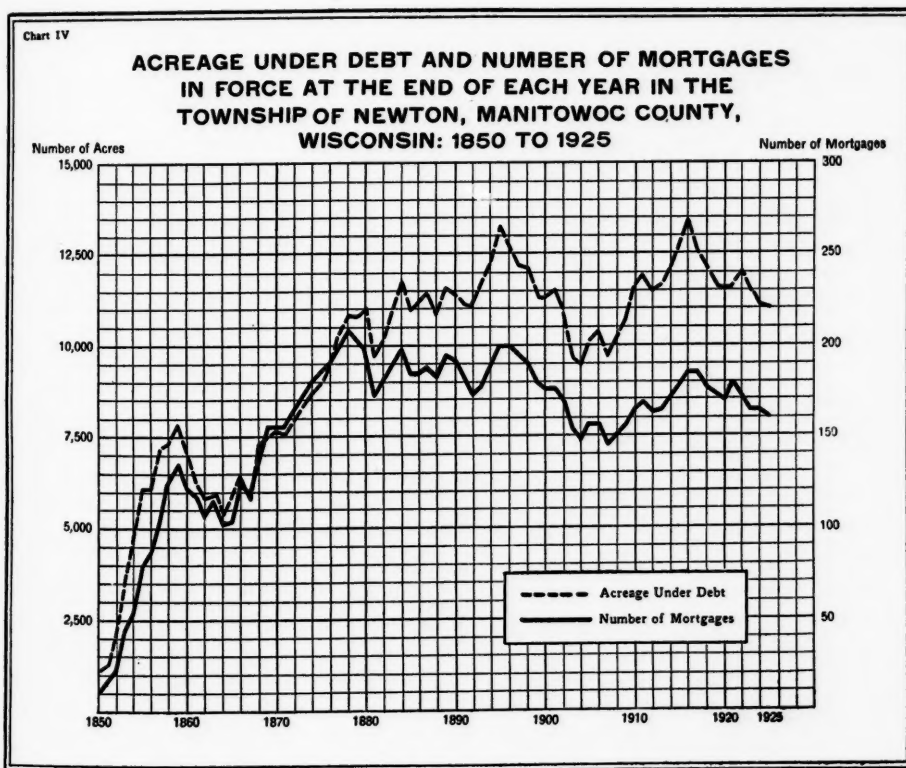
Cumulative Mortgage Encumbrance

So far we have noted the progress of mortgage indebtedness as it is revealed by the annual number of mortgages given, the acreage, and the values involved each year. This does not tell the whole story, for mortgages are not paid off at the end of each year, hence the unsatisfied mortgages must be considered with the new ones. The encumbrance at the end of 1850 is measured by the mortgages given that year plus all those given in 1848 and 1849 but not satisfied. The mortgage encumbrance of 1851 likewise consisted of all the old mortgages still in force plus all those given during the year and still unsatisfied. This method was used to

ascertain the encumbrance of the town for the whole period in terms of the number of mortgages, the acreage covered by debt, and the amount of debt. Mortgages that carried no satisfaction were entered for the average length of time of the other mortgages for the five-year period in which they were given (see Table I).

Chart IV shows the growth of mortgage indebtedness in terms of the number of mortgages in force at the end of each year. There was a more or less steady upward trend until 1880, after which there were some fluctuations, but they were unimportant.

The largest acreage under debt was in 1916 with 13,476 acres mortgaged; after that there was a downward trend



until in 1925 the figure was about the same as in 1880. The tendency for the acreage to remain constant after the early period of farm development was passed is even more evident on Chart V. Ever since 1880 about one-half of the land in Newton has been encumbered.

This is in harmony with the facts noted previously. The number of mortgages given each year and the acreage mortgaged annually have not varied greatly during the last 60 years. Inasmuch as the average duration of the mortgages likewise has not fluctuated greatly from decade to decade, there is a certain stability in the mortgage situation. Indeed, a normal percentage of mortgaging seems to be established, evidently about one-half of the acreage of the township. Since mortgaging is largely a part of the process of land transfer, together with a certain amount of borrowing for other purposes, the mortgaging of land is simply a part of the system of land tenure. Even the numbers of land transfers exhibit a certain regularity, as indicated by the data available at this

stage of the investigation. Abnormal activity occurred in the speculative period before 1850 and the World War years.

It is interesting to compare Newton with Wisconsin and the United States in this respect. Before 1925 the United States Census presented its data by farms rather than by acreage, so the figures are not strictly comparable. Nevertheless, they are presented in Table III by census years 1890 to 1925. In 1890 over one-half of the town of Newton was mortgaged as compared with 28% of the owner-operated farms of the United States and 43% of Wisconsin farms. The stability of the situation in Newton is in marked contrast to the increase in the state and nation. All three have declined in indebtedness since 1920. In Newton this is partly explained by the fact that a number of farms sold during the war have been repossessed by the former owners or have been taken over by creditors. This tends to hide the distress of agriculture usually revealed by excessive mortgaging.

Chart VI shows the constantly mounting load of debt, which reached its peak in 1921, when the total indebtedness of

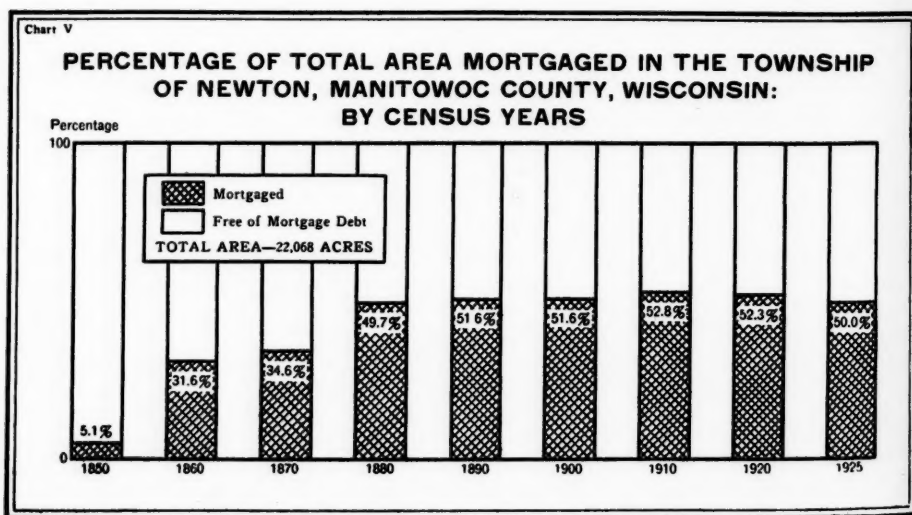


TABLE IV. CHANGES IN MORTGAGE ENCUMBRANCE OF NEWTON TOWNSHIP, BY CENSUS YEARS, 1850-1925

| Year | Mortgage Debt | Increase or Decrease Over Preceding Census Year | Percentage of Increase or Decrease |
|------|---------------|---|------------------------------------|
| 1850 | \$ 1,445 | | |
| 1860 | 27,513 | \$ 26,068 | 1804.01% |
| 1870 | 64,887 | 37,374 | 135.84 |
| 1880 | 135,383 | 70,496 | 108.64 |
| 1890 | 157,373 | 21,990 | 16.24 |
| 1900 | 211,594 | 54,221 | 34.45 |
| 1910 | 351,353 | 139,759 | 66.06 |
| 1920 | 575,464 | 224,111 | 63.79 |
| 1925 | 565,800 | -9,664 | -1.68 |

the township was \$652,404. Since then a decrease has occurred for reasons mentioned above. Table IV shows the encumbrance for each census year (not the average for the decade) and the increase and decrease over previous census years. The percentage increases are startling; only the 1880-1890 decade had a small increase and the last five years an actual decrease.

The Ratio of Debt to Value

However, the mortgage load *per se* does not measure the burden of debt borne by the land. This is indicated by the ratio the debt bears to the value of the land. When the study is completed, the value of the land, compiled from the deed records, will be available for the whole history of the township. In lieu of these figures Table V is presented, showing the values based upon the data assembled by the Wisconsin Tax Commission since 1900. The commission has obtained data on all *bona fide* sales of land throughout the state for the purpose of comparing sales values with assessed values. This is recorded by townships and shows the number of sales, the acres sold, and the prices obtained. In our table these fig-

ures are averaged by years and by five years. The annual figures are liable to be erratic because they may be based upon only a few genuinely commercial transfers. However, they are introduced to show the effect of the war and the post-war era on land values in even such a conservative farming area as eastern Wisconsin. The second column shows the debt per acre based upon the mortgage records and the last column the ratio of debt to value. The highest land values were reached in 1920, when the ratio of debt to value was a little over 31%. Land values began to drop in 1921, whereas the debt per acre reached its climax that year, bringing the ratio up to 42.5%. By 1925 land values were lower than in 1910, and the resulting ratio of mortgage encumbrance to sales value was almost 53%, the highest it has ever been.

It is interesting to compare the data for Newton with those for Wisconsin and the United States (Table VI).

In both 1910 and 1920 the ratio stood highest in Wisconsin. The increase during the decade from 1910 to 1920 was not extraordinary, but all three shared the increasing mortgage burden in the post-war years.

TABLE V. RATIO OF DEBT TO VALUE IN NEWTON TOWNSHIP, 1900-1925

| Year | Value per Acre | Debt per Acre | Ratio of Debt to Value |
|-----------|----------------|---------------|------------------------|
| 1900-1904 | \$ 76.80 | \$21.00 | 27.3% |
| 1905-1909 | 89.60 | 26.30 | 29.6 |
| 1910-1914 | 104.20 | 32.80 | 31.5 |
| 1915 | 123.10 | 37.60 | 30.5 |
| 1916 | 115.30 | 39.50 | 34.3 |
| 1917 | 120.50 | 43.20 | 35.8 |
| 1918 | 118.90 | 44.40 | 37.3 |
| 1919 | 128.70 | 47.30 | 36.8 |
| 1920 | 158.80 | 49.90 | 31.4 |
| 1921 | 133.00 | 56.50 | 42.5 |
| 1922 | 134.10 | 51.00 | 38.0 |
| 1923 | 133.30 | 53.10 | 39.8 |
| 1924 | 131.30 | 52.90 | 40.3 |
| 1925 | 97.10 | 51.30 | 52.8 |

TABLE VI. RATIO OF DEBT TO LAND VALUES

| Year | Newton | Wisconsin | United States |
|------|--------|-----------|---------------|
| 1910 | 30.1% | 34.3% | 27.3% |
| 1920 | 31.4 | 37.8 | 29.1 |
| 1925 | 52.8 | 49.0 | 41.9 |

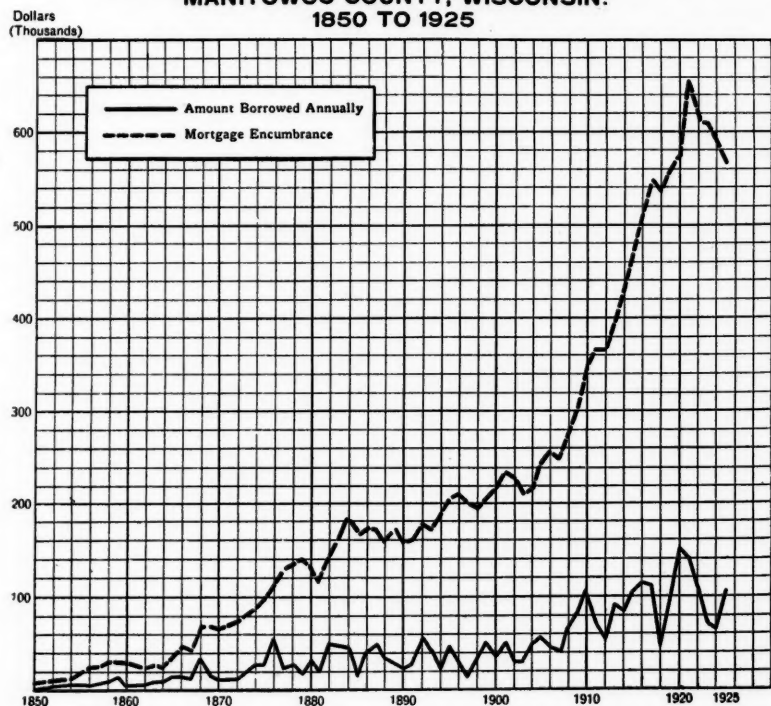
Summary

In this study of farm credit in Newton we are dealing with a stable, more or less homogeneous community with considerable capital accumulation—a capital-exporting rather than importing area. This description applies equally

well to all of eastern Wisconsin. The most significant fact is that after the farms were fully established (about 1880) the number of mortgages given each year, the acreage placed under mortgage, and the number of mortgages satisfied has remained practically constant. This means that the total encumbrance has not changed much since 1880. In other words, the normal amount of encumbrance is about one-half the area of the township. However, the mortgage burden measured in dollars of total debt and in the ratio of debt to value of land has grown.

Chart VI

AMOUNTS BORROWED ANNUALLY AND CUMULATIVE MORTGAGE ENCUMBRANCE IN THE TOWNSHIP OF NEWTON, MANITOWOC COUNTY, WISCONSIN: 1850 TO 1925



SOME MEASURES AND MEASUREMENTS OF TELEPHONE UTILITY TAXATION

By HERBERT B. DORAU AND MARJORIE ALEXANDER¹

THERE are numerous ways of measuring and expressing the relative tax burden of an industry. No one of them has been found adequate. It becomes necessary, then, to select a number of methods of measurement and use one against the other. Furthermore, the methods of taxing public utilities in particular are so varied and often uncertain that comparisons between measures and results of particular methods of taxation appear to afford no adequate test.

This brief study of the changing amount of telephone taxes has two purposes: First, to report the facts with respect to the amount of the tax burden of the telephone industry measured in various ways; and second, to offer certain lines of explanation and interpretation, if not reconciliation, between the results obtained by the various measures and approaches.

All Class A, B, and C telephone companies have been included in this study.² They have been further classified according to six geographic divisions³ and as to whether they were Bell System or non-Bell companies.

It has seemed desirable to establish rigid lines of classification and to shift companies from one class to another

as their status changed. Thus while the Interstate Commerce Commission reports carry a company in a given class until it has had revenues of more or less than the upper and lower limits of that class for three years, in this study the classification has been changed in the year in which a change of status occurred. In one other respect does this classification vary from that of the Interstate Commerce Commission. Prior to 1922 the Interstate Commerce Commission classification included companies having revenues from \$10,000 to \$50,000. This group has not been used here so that the classes would be uniform throughout the period. These efforts to keep the classes of companies homogeneous rather than the companies constant seem justified by the purposes of the study. By shifting companies from one class to another as required by their changing revenue or corporate affiliation, the ratios obtained are more representative of companies of certain size and affiliation.

Special attention is called to the fact that the figures for the American Telephone and Telegraph Company have been excluded throughout so that the ratios might more nearly represent the

three classes, there are hundreds of smaller telephone plants in the United States but since these do not render adequate reports they have not been considered here.

³ The districting is that used by the United States Independent Telephone Association. The Mountain States District of the Bell System is included in the Western District.

¹ The writers wish to acknowledge the help of Mr. Hubert Havlik in the statistical work.

² The classification is that now used by the Interstate Commerce Commission, in which Class A companies are those with revenue of \$250,000 and over, Class B, those with \$100,000 revenue to \$250,000, and Class C, those having revenues from \$50,000 to \$100,000. Besides those in these

conditions as they exist in the operating companies.⁴

The tax factor used in this study consists of the amount of taxes accrued and charged to "Taxes Assignable to Operations" as this item appears in the income accounts from year to year. In

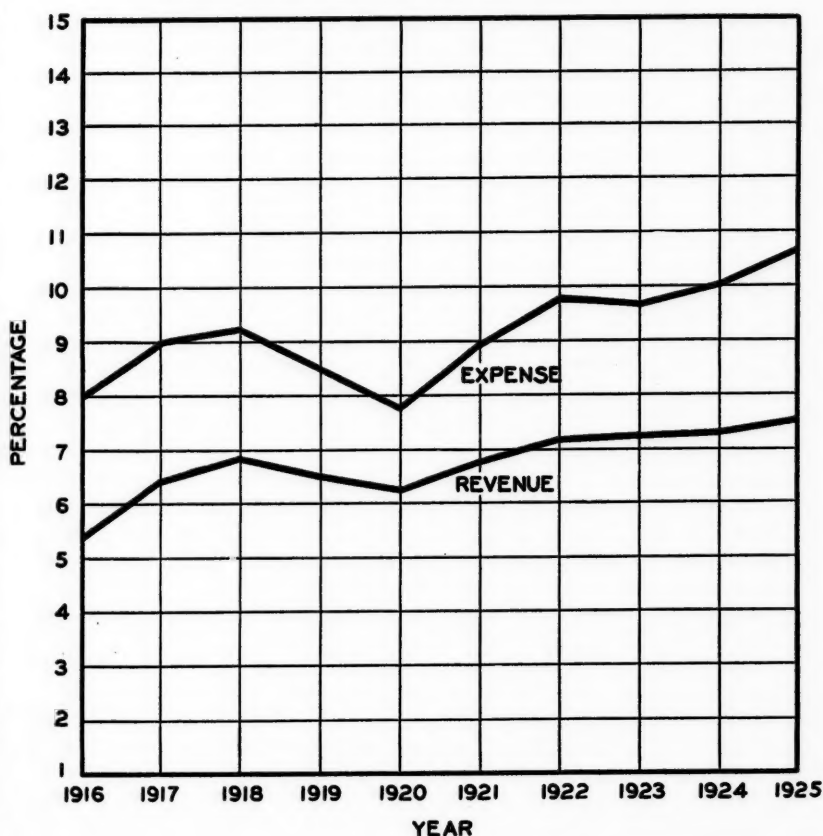
⁴ This accounts for the difference between these results and the summary for Class A companies published in the *Journal* for October, 1926.

some companies and in some years this is not representative of the exact amount of taxes paid, but this slight difference is lost in the average. Other taxes are not included because they were so unimportant in total that they had no material effect on the average.

For the period from 1916 to 1926 this tax figure has been related to three basic facts, namely, the operating rev-

Chart I

THE RATIO OF TAXES TO OPERATING REVENUE AND TO OPERATING EXPENSE FOR ALL CLASS A, B, AND C TELEPHONE COMPANIES FROM 1916 - 1925



enues; the operating expenses, in which have been included uncollectible revenues; and operating income before payment of taxes, which is the difference between revenues and expenses as defined above.

I. Measurements of Tax Burdens

The ratio of taxes to operating revenue. Of every dollar of telephone operating revenue, 7.56 cents went for the payment of taxes in 1925. There has been a gradual upward trend in the tax burden over the past 10 years (Chart I). In 1916 the ratio of taxes to operating revenue for the entire country was 5.45%. This increased, except for a slight drop in 1919 and 1920, to 7.56% in 1925, as shown in Table I.

The companies in the Bell System have a generally higher percentage of taxes to revenues than non-Bell companies. In 1925 the ratio of taxes to operating revenue was 7.57% for the Bell companies and 7.48% for the non-Bell companies.

The different classes of companies also have a varying tax burden measured in this manner. For 1916 and 1925 the figures were:

| | 1916 | 1925 |
|-------------|-------|-------|
| Class A ... | 5.51% | 7.56% |
| Class B ... | 4.42 | 7.65 |
| Class C ... | 4.50 | 7.07 |

The companies grouped according to the six geographical divisions show a similar upward trend over the 10-year period, but variations are evident among the districts (Table I). No one district has had a consistently higher ratio than any other, although the Northwestern district was noticeably lower than the other five districts except in the years 1923 and 1924 (Table I).

The ratio of taxes to operating expenses. The ratios of taxes to expenses follow trends somewhat similar to the ratio of taxes to operating revenue, but they are naturally on a somewhat higher level (Chart I). For the whole country 10.69% of the expenses were for taxes in 1925, as compared to 8.00% in 1916 (Table II).

The Bell System companies had a ratio of 8.01% in 1916, and 10 years later this figure had increased to 10.65%. The ratios for the non-Bell companies were 7.93% for 1916 and 11.17% for 1925.

The percentage of taxes to expenses also varied with the three classes of companies according to size. Thus the ratios of taxes to expenses were:

| | 1916 | 1925 |
|------------|-------|--------|
| Class A .. | 8.08% | 10.69% |
| Class B .. | 6.63 | 11.09 |
| Class C .. | 6.53 | 9.76 |

Variations were also found among the companies in the several geographical divisions. The Northwestern and Eastern districts were the lowest of the six districts in 1925, and the Southwestern district was the highest.

Ratio of taxes to operating income. The proportion of taxes to operating income, as given in Table III, shows more variations than the other ratios (Chart II). For all companies, taxes were 26.48% of the operating income for 1925. Ten years previous this ratio was only 17.45%. The Bell companies show a consistently higher ratio of taxes to operating income than the non-Bell companies.

| | 1916 | 1925 |
|--------------------------|--------|--------|
| Bell Companies. | 17.96% | 26.79% |
| Non-Bell Companies | 13.96 | 22.95 |

The several classes of companies have the following ratios of taxes to operating income:

TABLE I. PERCENTAGE OF TAXES ASSIGNABLE TO OPERATIONS TO OPERATING REVENUE
FOR CLASS A, B, AND C BELL AND NON-BELL TELEPHONE COMPANIES, BY
DISTRICTS, 1916-1925

| Classification | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|----------------------------------|------|------|------|-------|------|-------|-------|------|-------|-------|
| EASTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 5.48 | 6.91 | 7.21 | 6.41 | 6.09 | 6.25 | 6.69 | 6.40 | 6.03 | 6.44 |
| Non-Bell..... | 5.50 | 6.37 | 7.02 | 7.68 | 7.28 | 5.07 | 5.29 | 5.47 | 6.26 | 6.83 |
| Total A Companies..... | 5.48 | 6.88 | 7.20 | 6.49 | 6.17 | 6.20 | 6.63 | 6.36 | 6.04 | 6.46 |
| B Companies | | | | | | | | | | |
| Bell..... | 3.78 | 3.92 | 4.93 | 5.57 | 5.84 | 5.51 | 6.06 | 6.20 | 6.92 | 7.76 |
| Non-Bell..... | 4.76 | 5.40 | 5.89 | 7.00 | 6.48 | 7.18 | 7.97 | 8.30 | 7.96 | 7.81 |
| Total B Companies..... | 4.57 | 5.14 | 5.73 | 6.71 | 6.34 | 6.80 | 7.53 | 7.84 | 7.97 | 7.80 |
| C Companies | | | | | | | | | | |
| Bell..... | 5.38 | 5.48 | 6.61 | 6.52 | 4.95 | 6.41 | 7.50 | 7.47 | 7.40 | 6.01 |
| Non-Bell..... | 5.71 | 5.35 | 7.72 | 6.50 | 6.56 | 7.40 | 7.24 | 8.19 | 8.23 | 10.53 |
| Total C Companies..... | 5.62 | 5.39 | 7.33 | 6.51 | 6.14 | 7.13 | 7.32 | 7.98 | 8.04 | 9.46 |
| Total Bell..... | 5.47 | 6.89 | 7.20 | 6.41 | 6.08 | 6.24 | 6.69 | 6.40 | 6.04 | 6.45 |
| Total Non-Bell..... | 5.37 | 6.02 | 6.78 | 7.41 | 7.01 | 6.02 | 6.27 | 6.64 | 6.99 | 7.53 |
| Total Eastern District..... | 5.46 | 6.81 | 7.16 | 6.50 | 6.17 | 6.23 | 6.66 | 6.41 | 6.08 | 6.51 |
| SOUTHERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 6.43 | 6.84 | 6.31 | 6.48 | 6.13 | 7.18 | 8.07 | 8.93 | 9.26 | 9.09 |
| Non-Bell..... | 5.89 | 6.85 | 6.99 | 8.24 | 6.19 | 6.63 | 6.42 | 8.22 | 6.80 | 6.56 |
| Total A Companies..... | 6.41 | 6.84 | 6.33 | 6.56 | 6.14 | 7.15 | 7.97 | 8.88 | 9.14 | 8.97 |
| B Companies | | | | | | | | | | |
| Bell..... | 4.26 | 5.36 | 6.48 | 7.53 | 6.10 | 6.49 | 6.97 | 8.94 | 10.51 | 8.10 |
| Non-Bell..... | 4.18 | 5.50 | 5.80 | 5.87 | 5.07 | 4.86 | 5.62 | 7.19 | 7.07 | 7.37 |
| Total B Companies..... | 4.21 | 5.45 | 6.11 | 6.64 | 5.39 | 5.38 | 5.87 | 7.52 | 8.14 | 7.51 |
| C Companies | | | | | | | | | | |
| Bell..... | 3.87 | 4.43 | 5.45 | 4.56 | 5.93 | 5.14 | 5.84 | 6.30 | 6.14 | ..... |
| Non-Bell..... | 4.79 | 5.16 | 6.48 | 6.17 | 5.66 | 5.93 | 6.57 | 6.57 | 8.42 | 7.19 |
| Total C Companies..... | 4.58 | 5.01 | 6.35 | 5.97 | 5.09 | 5.85 | 6.50 | 6.54 | 8.08 | 7.19 |
| Total Bell..... | 6.37 | 6.80 | 6.31 | 6.49 | 6.13 | 7.17 | 8.06 | 8.92 | 9.26 | 9.08 |
| Total Non-Bell..... | 5.10 | 6.06 | 6.53 | 7.33 | 5.82 | 6.15 | 6.31 | 7.86 | 7.16 | 6.81 |
| Total Southern District..... | 6.28 | 6.74 | 6.33 | 6.55 | 6.11 | 7.09 | 7.91 | 8.83 | 9.11 | 8.94 |
| CENTRAL DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 5.86 | 6.32 | 6.44 | 6.33 | 6.48 | 7.66 | 7.87 | 8.00 | 8.81 | 8.85 |
| Non-Bell..... | 6.74 | 6.67 | 7.41 | 7.37 | 6.56 | 6.31 | 6.67 | 7.47 | 8.42 | 8.65 |
| Total A Companies..... | 5.90 | 6.33 | 6.49 | 6.38 | 6.48 | 7.59 | 7.81 | 7.98 | 8.79 | 8.84 |
| B Companies | | | | | | | | | | |
| Bell..... | 3.52 | 5.07 | 6.01 | 6.38 | 4.47 | 4.72 | 5.89 | 6.96 | 9.19 | 10.90 |
| Non-Bell..... | 4.43 | 4.71 | 5.90 | 6.05 | 5.53 | 5.61 | 6.06 | 6.34 | 6.99 | 7.13 |
| Total B Companies..... | 4.27 | 4.77 | 5.92 | 6.61 | 5.37 | 5.53 | 6.03 | 6.39 | 7.10 | 7.22 |
| C Companies | | | | | | | | | | |
| Bell..... | 4.29 | 5.84 | 8.28 | 9.27 | 7.88 | 10.25 | 9.62 | 8.99 | 9.06 | 7.98 |
| Non-Bell..... | 3.45 | 3.54 | 4.97 | 4.88 | 4.73 | 5.20 | 5.45 | 5.90 | 4.97 | 5.36 |
| Total C Companies..... | 3.50 | 3.90 | 5.50 | 5.34 | 5.09 | 5.84 | 6.05 | 6.23 | 5.42 | 5.75 |
| Total Bell..... | 5.83 | 6.30 | 6.45 | 6.34 | 6.47 | 7.66 | 7.87 | 8.00 | 8.81 | 8.85 |
| Total Non-Bell..... | 5.09 | 5.22 | 6.25 | 6.50 | 5.79 | 5.84 | 6.20 | 6.59 | 7.03 | 7.33 |
| Total Central District..... | 5.75 | 6.18 | 6.43 | 6.36 | 6.38 | 7.47 | 7.70 | 7.87 | 8.05 | 8.72 |
| WESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 5.11 | 5.97 | 7.13 | 6.62 | 7.29 | 7.50 | 7.56 | 7.65 | 7.81 | 8.23 |
| Non-Bell..... | 3.82 | 5.98 | 4.55 | 5.28 | 5.25 | 6.92 | 7.95 | 8.74 | 7.95 | 7.24 |
| Total A Companies..... | 5.10 | 5.97 | 7.10 | 6.60 | 7.23 | 7.48 | 7.57 | 7.68 | 7.81 | 8.20 |
| B Companies | | | | | | | | | | |
| Bell..... | 6.87 | 6.87 | 8.15 | 10.59 | 8.12 | 5.30 | 6.58 | 6.68 | 6.89 | 6.49 |
| Non-Bell..... | 6.45 | 4.28 | 6.21 | 4.08 | 5.47 | 7.14 | 7.26 | 6.42 | 6.90 | 8.81 |
| Total B Companies..... | 6.50 | 4.67 | 6.45 | 5.22 | 6.33 | 6.96 | 7.20 | 6.44 | 6.89 | 8.51 |
| C Companies | | | | | | | | | | |
| Bell..... | 3.26 | 3.80 | 5.53 | 5.67 | 6.04 | 7.74 | 8.20 | 7.57 | 7.18 | 7.17 |
| Non-Bell..... | 5.02 | 6.36 | 6.99 | 7.30 | 7.10 | 11.00 | 12.03 | 6.44 | 6.45 | 5.89 |
| Total C Companies..... | 4.73 | 5.81 | 6.84 | 7.05 | 6.94 | 10.34 | 11.19 | 6.86 | 6.04 | 6.20 |
| Total Bell..... | 5.11 | 5.96 | 7.13 | 6.64 | 7.29 | 7.49 | 7.56 | 7.64 | 7.80 | 8.22 |
| Total Non-Bell..... | 5.47 | 5.37 | 6.15 | 5.57 | 5.74 | 7.68 | 8.36 | 7.71 | 7.48 | 8.77 |
| Total Western District..... | 5.13 | 5.93 | 7.08 | 6.58 | 7.21 | 7.50 | 7.60 | 7.65 | 7.79 | 8.25 |
| NORTHWESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 3.77 | 4.88 | 6.15 | 5.16 | 5.28 | 5.84 | 6.31 | 6.63 | 6.50 | 5.90 |
| Non-Bell..... | 3.83 | 4.68 | 5.20 | 5.94 | 4.85 | 5.89 | 5.97 | 6.61 | 7.53 | 7.45 |
| Total A Companies..... | 3.79 | 4.83 | 5.92 | 5.35 | 5.17 | 5.85 | 6.22 | 6.63 | 6.75 | 6.28 |
| B Companies | | | | | | | | | | |
| Bell..... | 3.79 | 3.63 | 5.06 | 7.97 | 8.24 | 8.81 | 8.98 | 7.50 | 7.47 | 7.19 |
| Non-Bell..... | 3.38 | 3.50 | 3.94 | 5.83 | 5.08 | 5.82 | 6.54 | 6.24 | 6.23 | 7.24 |
| Total B Companies..... | 3.69 | 3.57 | 4.55 | 7.18 | 5.79 | 6.47 | 7.06 | 6.51 | 6.49 | 7.23 |
| C Companies | | | | | | | | | | |
| Bell..... | 3.94 | 4.46 | 5.75 | 6.47 | 6.59 | 6.98 | 7.85 | 9.22 | 9.77 | 8.46 |
| Non-Bell..... | 3.90 | 4.22 | 4.59 | 5.79 | 3.73 | 4.61 | 4.05 | 5.44 | 5.64 | 5.40 |
| Total C Companies..... | 3.92 | 4.54 | 4.70 | 5.95 | 3.97 | 4.76 | 5.14 | 5.86 | 6.03 | 5.38 |
| Total Bell..... | 3.78 | 3.84 | 6.12 | 5.22 | 5.30 | 5.86 | 6.33 | 6.65 | 6.52 | 5.92 |
| Total Non-Bell..... | 3.82 | 4.60 | 5.03 | 5.91 | 4.74 | 5.71 | 5.87 | 6.44 | 7.22 | 7.18 |
| Total Northwestern District..... | 3.79 | 4.78 | 5.83 | 5.41 | 5.15 | 5.82 | 6.20 | 6.59 | 6.72 | 6.27 |

TABLE I (Continued). PERCENTAGE OF TAXES ASSIGNABLE TO OPERATIONS TO OPERATING REVENUE FOR CLASS A, B, AND C BELL AND NON-BELL TELEPHONE COMPANIES, BY DISTRICTS, 1916-1925

| Classification | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|---------------------------------------|------|------|-------|------|------|------|------|-------|-------|-------|
| SOUTHWESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 5.77 | 6.63 | 7.55 | 7.90 | 6.53 | 7.94 | 8.84 | 9.32 | 9.21 | 9.16 |
| Non-Bell..... | 5.40 | 6.13 | 6.97 | 6.61 | 5.67 | 5.11 | 6.28 | 5.61 | 10.24 | 9.16 |
| Total A Companies..... | 5.70 | 6.55 | 7.40 | 7.74 | 6.35 | 7.55 | 8.37 | 8.77 | 9.23 | 9.16 |
| B Companies | | | | | | | | | | |
| Bell..... | 3.42 | 3.91 | ..... | 3.86 | 7.63 | 6.53 | 7.27 | 10.03 | 10.29 | 10.42 |
| Non-Bell..... | 3.10 | 3.51 | 4.56 | 5.44 | 5.34 | 6.94 | 7.52 | 7.13 | 7.02 | 7.35 |
| Total B Companies..... | 3.23 | 3.66 | 4.56 | 5.30 | 5.99 | 6.83 | 7.44 | 7.78 | 7.81 | 7.84 |
| C Companies | | | | | | | | | | |
| Bell..... | 4.32 | 4.45 | 4.51 | 4.62 | 2.23 | 2.05 | 2.55 | 1.81 | 2.24 | ..... |
| Non-Bell..... | 3.45 | 5.14 | 7.15 | 5.77 | 6.50 | 7.06 | 6.98 | 6.34 | 5.98 | 5.93 |
| Total C Companies..... | 3.77 | 4.95 | 6.42 | 5.53 | 5.91 | 6.40 | 6.28 | 5.64 | 5.76 | 5.93 |
| Total Bell..... | 5.70 | 6.56 | 7.52 | 7.87 | 6.54 | 7.90 | 8.80 | 9.32 | 9.21 | 9.16 |
| Total Non-Bell..... | 4.98 | 5.69 | 6.66 | 6.31 | 5.68 | 6.03 | 6.47 | 5.87 | 7.75 | 7.80 |
| Total Southwestern District..... | 5.55 | 6.39 | 7.35 | 7.61 | 6.33 | 7.51 | 8.31 | 8.71 | 9.15 | 9.09 |
| GRAND TOTALS FOR ALL DISTRICTS | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 5.52 | 6.55 | 6.94 | 6.50 | 6.31 | 6.89 | 7.31 | 7.35 | 7.37 | 7.57 |
| Non-Bell..... | 5.28 | 6.04 | 6.61 | 7.02 | 6.16 | 5.84 | 6.10 | 6.46 | 7.24 | 7.52 |
| All A Companies..... | 5.51 | 6.51 | 6.92 | 6.54 | 6.30 | 6.82 | 7.23 | 7.30 | 7.36 | 7.56 |
| B Companies | | | | | | | | | | |
| Bell..... | 3.93 | 4.57 | 5.82 | 6.68 | 6.29 | 5.94 | 6.57 | 7.24 | 7.90 | 8.07 |
| Non-Bell..... | 4.62 | 4.88 | 5.74 | 6.33 | 5.85 | 6.44 | 7.05 | 7.21 | 7.36 | 7.57 |
| All B Companies..... | 4.42 | 4.80 | 5.75 | 6.40 | 5.95 | 6.34 | 6.90 | 7.21 | 7.45 | 7.65 |
| C Companies | | | | | | | | | | |
| Bell..... | 4.51 | 5.03 | 6.41 | 6.47 | 5.65 | 6.97 | 7.68 | 7.53 | 7.73 | 6.87 |
| Non-Bell..... | 4.50 | 4.80 | 6.21 | 5.92 | 5.58 | 6.36 | 6.61 | 6.58 | 6.48 | 7.10 |
| All C Companies..... | 4.50 | 4.86 | 6.26 | 6.03 | 5.59 | 6.46 | 6.82 | 6.75 | 6.67 | 7.07 |
| Total Bell..... | 5.50 | 6.52 | 6.93 | 6.50 | 6.31 | 6.89 | 7.31 | 7.35 | 7.37 | 7.57 |
| Total Non-Bell..... | 5.02 | 5.59 | 6.33 | 6.70 | 6.02 | 6.04 | 6.36 | 6.65 | 7.15 | 7.48 |
| Grand Total..... | 5.45 | 6.42 | 6.86 | 6.52 | 6.27 | 6.80 | 7.22 | 7.29 | 7.35 | 7.56 |

| | 1916 | 1925 |
|-----------|--------|--------|
| Class A . | 17.65% | 26.53% |
| Class B . | 13.52 | 25.11 |
| Class C . | 15.04 | 25.70 |

The ratios of taxes to operating income for the six districts were all higher for 1925 than 1916 and unusually high in 1919 and 1920, years of high prices.

II. Analysis

The ratio of taxes to operating revenue. The ratio of taxes to operating revenue varies directly with the percentage of taxes to investment and inversely with the capital turnover. This fact may be demonstrated by expressing the ratio of taxes to revenue in terms of the percentage of taxes to investment and of capital turnover, which is operating revenue divided by the investment. Thus:

$$\frac{\text{Taxes}}{\text{Operating Revenue}} = \frac{\frac{\text{Taxes}}{\text{Investment}}}{\frac{\text{Operating Revenue}}{\text{Investment}}} = \frac{\text{Per Cent of Taxes to Investment}}{\text{Capital Turnover}}$$

From this it follows that the ratio of taxes to operating revenue varies directly with the percentage of taxes to investment and inversely with the capital turnover.

This generalization may be applied to certain data given in the tables for 1925. For instance, it is noted that the Northwestern district has the lowest percentage of taxes to operating revenue and the Southwestern has the highest such percentage. A question may arise as to how much of this difference is due to different percentages of taxes to investment and how much to a difference in the rate of capital turnover.

By substituting data from the tables in the above equation, the following is

TABLE II. PERCENTAGE OF TAXES ASSIGNABLE TO OPERATIONS TO OPERATING EXPENSES
FOR CLASS A, B, AND C BELL AND NON-BELL TELEPHONE COMPANIES, BY
DISTRICTS, 1916-1925

| Classification | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| EASTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell | 8.26 | 10.04 | 10.02 | 8.66 | 7.36 | 8.23 | 8.93 | 8.34 | 7.89 | 8.83 |
| Non-Bell | 8.73 | 9.86 | 11.02 | 11.17 | 10.41 | 6.61 | 7.26 | 7.89 | 9.23 | 10.33 |
| Total A Companies | 8.29 | 10.03 | 10.08 | 8.80 | 7.53 | 8.17 | 8.86 | 8.32 | 7.93 | 8.87 |
| B Companies | | | | | | | | | | |
| Bell | 5.02 | 5.07 | 6.33 | 7.43 | 7.70 | 7.41 | 8.51 | 8.69 | 9.94 | 11.21 |
| Non-Bell | 7.63 | 8.36 | 8.64 | 9.46 | 8.59 | 9.46 | 10.93 | 11.85 | 10.98 | 11.15 |
| Total B Companies | 7.04 | 7.69 | 8.21 | 9.04 | 8.39 | 9.00 | 10.38 | 11.14 | 10.70 | 11.17 |
| C Companies | | | | | | | | | | |
| Bell | 6.99 | 6.95 | 8.48 | 8.12 | 7.25 | 8.58 | 10.67 | 10.90 | 10.38 | 8.04 |
| Non-Bell | 8.65 | 7.58 | 10.53 | 8.97 | 8.82 | 10.23 | 10.20 | 11.62 | 14.85 | 14.85 |
| Total C Companies | 8.10 | 7.39 | 9.79 | 8.69 | 8.45 | 9.76 | 10.34 | 11.41 | 11.22 | 13.17 |
| Total Bell | 8.23 | 9.99 | 8.65 | 7.36 | 8.22 | 8.93 | 8.34 | 7.90 | 8.84 | 8.84 |
| Total Non-Bell | 8.49 | 9.23 | 10.28 | 10.52 | 9.72 | 7.94 | 8.64 | 9.53 | 10.04 | 11.12 |
| Total Eastern District | 8.26 | 9.93 | 10.02 | 8.75 | 7.56 | 8.21 | 8.91 | 8.41 | 8.01 | 8.94 |
| SOUTHERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell | 9.44 | 9.54 | 7.96 | 7.74 | 7.47 | 9.24 | 11.11 | 12.73 | 13.21 | 13.12 |
| Non-Bell | 9.85 | 11.20 | 10.05 | 11.09 | 8.04 | 8.83 | 8.84 | 11.82 | 9.48 | 9.03 |
| Total A Companies | 9.45 | 9.59 | 8.05 | 7.89 | 7.49 | 9.22 | 10.98 | 12.65 | 13.02 | 12.93 |
| B Companies | | | | | | | | | | |
| Bell | 6.45 | 7.86 | 8.95 | 10.02 | 7.96 | 8.52 | 9.37 | 11.58 | 14.02 | 10.01 |
| Non-Bell | 6.49 | 7.69 | 7.74 | 7.50 | 6.39 | 6.40 | 7.45 | 10.47 | 10.82 | 11.41 |
| Total B Companies | 6.47 | 7.76 | 8.28 | 8.65 | 6.86 | 7.08 | 7.80 | 10.70 | 11.37 | 11.10 |
| C Companies | | | | | | | | | | |
| Bell | 5.49 | 6.00 | 6.83 | 5.48 | 7.49 | 6.13 | 7.42 | 8.18 | 8.17 | ..... |
| Non-Bell | 7.27 | 7.58 | 9.05 | 8.07 | 7.04 | 7.37 | 8.99 | 9.23 | 14.18 | 9.90 |
| Total C Companies | 6.84 | 7.25 | 8.73 | 7.74 | 7.08 | 7.24 | 8.83 | 9.10 | 13.10 | 9.90 |
| Total Bell | 9.36 | 9.50 | 7.98 | 7.76 | 7.47 | 9.23 | 11.10 | 12.63 | 13.20 | 13.10 |
| Total Non-Bell | 8.19 | 9.13 | 9.38 | 10.00 | 7.43 | 8.05 | 8.63 | 11.29 | 10.22 | 9.67 |
| Total Southern District | 9.28 | 9.47 | 8.07 | 7.91 | 7.47 | 9.14 | 10.89 | 12.59 | 12.99 | 12.88 |
| CENTRAL DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell | 8.00 | 8.01 | 7.85 | 7.59 | 7.53 | 10.08 | 10.69 | 10.84 | 11.93 | 12.39 |
| Non-Bell | 10.39 | 10.06 | 11.25 | 10.63 | 8.59 | 8.18 | 9.42 | 11.13 | 12.46 | 13.37 |
| Total A Companies | 8.10 | 8.10 | 7.98 | 7.71 | 7.58 | 9.98 | 10.03 | 10.85 | 11.95 | 12.41 |
| B Companies | | | | | | | | | | |
| Bell | 4.89 | 6.76 | 7.45 | 7.79 | 5.86 | 6.67 | 7.98 | 10.43 | 13.09 | 15.34 |
| Non-Bell | 6.57 | 6.89 | 7.89 | 8.05 | 7.18 | 7.40 | 8.18 | 8.96 | 9.85 | 10.29 |
| Total B Companies | 6.26 | 6.87 | 7.82 | 8.77 | 6.99 | 7.35 | 8.17 | 9.08 | 10.01 | 10.42 |
| C Companies | | | | | | | | | | |
| Bell | 6.30 | 8.63 | 12.04 | 12.41 | 11.46 | 14.10 | 13.61 | 12.48 | 12.54 | 10.77 |
| Non-Bell | 5.00 | 4.95 | 6.74 | 6.13 | 5.69 | 6.35 | 7.18 | 7.76 | 6.49 | 7.35 |
| Total C Companies | 5.17 | 5.60 | 7.04 | 6.75 | 6.24 | 7.23 | 8.05 | 8.23 | 7.12 | 7.87 |
| Total Bell | 7.96 | 8.00 | 7.87 | 7.61 | 7.53 | 10.99 | 10.69 | 10.84 | 11.93 | 12.38 |
| Total Non-Bell | 7.61 | 7.65 | 8.80 | 8.84 | 7.40 | 7.53 | 8.51 | 9.29 | 9.90 | 10.73 |
| Total Central District | 7.92 | 7.96 | 7.96 | 7.72 | 7.51 | 9.80 | 10.47 | 10.71 | 11.76 | 12.25 |
| WESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell | 7.24 | 8.36 | 9.74 | 8.63 | 9.76 | 10.01 | 10.14 | 8.52 | 10.71 | 11.84 |
| Non-Bell | 6.10 | 7.80 | 6.64 | 9.10 | 7.68 | 10.36 | 12.34 | 14.35 | 13.50 | 15.62 |
| Total A Companies | 7.23 | 8.35 | 9.71 | 8.64 | 9.71 | 10.01 | 10.19 | 8.70 | 10.79 | 11.94 |
| B Companies | | | | | | | | | | |
| Bell | 6.60 | 7.33 | 9.27 | 10.98 | 9.61 | 5.03 | 8.42 | 6.94 | 6.67 | 6.47 |
| Non-Bell | 10.83 | 6.04 | 8.02 | 5.06 | 7.31 | 9.95 | 10.79 | 9.22 | 9.56 | 13.27 |
| Total B Companies | 9.98 | 6.28 | 8.19 | 6.26 | 8.13 | 9.27 | 10.54 | 9.00 | 9.24 | 12.03 |
| C Companies | | | | | | | | | | |
| Bell | 3.35 | 3.91 | 5.37 | 5.71 | 6.61 | 8.76 | 9.08 | 9.13 | 8.37 | 10.18 |
| Non-Bell | 7.65 | 9.54 | 10.25 | 9.81 | 9.86 | 15.80 | 16.93 | 9.28 | 9.03 | 8.62 |
| Total C Companies | 6.68 | 7.96 | 9.53 | 9.03 | 9.26 | 14.08 | 14.84 | 9.22 | 8.83 | 9.00 |
| Total Bell | 7.21 | 8.33 | 9.73 | 8.63 | 9.75 | 9.99 | 10.13 | 8.64 | 10.70 | 11.81 |
| Total Non-Bell | 8.75 | 7.52 | 8.41 | 7.81 | 8.09 | 11.14 | 12.60 | 11.91 | 11.68 | 14.08 |
| Total Western District | 7.28 | 8.28 | 9.66 | 8.59 | 9.67 | 10.04 | 10.24 | 8.76 | 10.74 | 11.92 |
| NORTHWESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell | 5.31 | 6.74 | 8.51 | 6.84 | 6.69 | 7.58 | 8.83 | 9.51 | 9.32 | 8.58 |
| Non-Bell | 5.85 | 6.85 | 7.68 | 8.12 | 6.33 | 7.84 | 8.79 | 9.84 | 11.50 | 11.43 |
| Total A Companies | 5.43 | 6.77 | 8.33 | 7.15 | 6.60 | 7.64 | 8.82 | 9.59 | 9.84 | 9.26 |
| B Companies | | | | | | | | | | |
| Bell | 4.90 | 3.98 | 5.57 | 11.00 | 11.14 | 10.73 | 10.78 | 9.46 | 9.20 | 9.01 |
| Non-Bell | 4.41 | 4.51 | 4.81 | 8.53 | 6.49 | 8.28 | 9.21 | 9.05 | 9.28 | 10.74 |
| Total B Companies | 4.78 | 4.21 | 5.24 | 10.12 | 7.49 | 8.88 | 9.59 | 9.15 | 9.26 | 10.32 |
| C Companies | | | | | | | | | | |
| Bell | 5.50 | 6.11 | 7.29 | 8.90 | 9.36 | 10.31 | 11.28 | 13.41 | 14.19 | 12.52 |
| Non-Bell | 5.68 | 7.09 | 6.00 | 7.76 | 4.72 | 5.99 | 6.00 | 7.32 | 7.55 | 7.27 |
| Total C Companies | 5.61 | 6.67 | 6.43 | 8.02 | 5.07 | 6.22 | 6.73 | 7.95 | 8.14 | 7.55 |
| Total Bell | 5.29 | 6.66 | 8.40 | 6.93 | 6.72 | 7.61 | 8.85 | 9.54 | 9.35 | 8.59 |
| Total Non-Bell | 5.77 | 6.71 | 7.31 | 8.08 | 6.16 | 7.59 | 8.50 | 9.44 | 10.82 | 10.82 |
| Total Northwestern District | 5.40 | 6.67 | 8.13 | 7.25 | 6.57 | 7.60 | 8.76 | 9.51 | 9.75 | 9.21 |

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TABLE II (Continued). PERCENTAGE OF TAXES ASSIGNABLE TO OPERATIONS TO OPERATING EXPENSES FOR CLASS A, B, AND C BELL AND NON-BELL TELEPHONE COMPANIES, BY DISTRICTS, 1916-1925

| Classification | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|---------------------------------------|------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| SOUTHWESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 8.45 | 9.17 | 10.21 | 10.68 | 8.44 | 11.01 | 13.37 | 14.25 | 13.88 | 14.16 |
| Non-Bell..... | 9.48 | 10.14 | 11.14 | 9.97 | 7.89 | 8.25 | 9.19 | 8.29 | 17.93 | 16.38 |
| Total A Companies..... | 8.62 | 9.30 | 10.33 | 10.59 | 8.33 | 10.52 | 12.59 | 13.33 | 13.93 | 14.21 |
| B Companies | | | | | | | | | | |
| Bell..... | 4.79 | 5.22 | ..... | 5.61 | 9.71 | 8.00 | 9.38 | 13.86 | 14.99 | 17.36 |
| Non-Bell..... | 5.16 | 5.29 | 6.83 | 7.84 | 7.54 | 10.07 | 11.17 | 10.78 | 11.27 | 11.53 |
| Total B Companies..... | 4.99 | 5.26 | 6.83 | 7.65 | 8.20 | 9.42 | 10.58 | 11.52 | 12.24 | 12.41 |
| C Companies | | | | | | | | | | |
| Bell..... | 5.79 | 5.72 | 5.86 | 6.38 | 2.78 | 2.58 | 3.52 | 2.23 | 2.80 | ..... |
| Non-Bell..... | 5.43 | 7.89 | 10.09 | 7.68 | 8.12 | 8.52 | 8.74 | 8.04 | 7.92 | 8.19 |
| Total C Companies..... | 5.57 | 7.20 | 8.85 | 7.41 | 7.38 | 7.76 | 7.98 | 7.12 | 7.60 | 8.19 |
| Total Bell..... | 8.34 | 9.06 | 10.17 | 10.64 | 8.44 | 10.94 | 13.28 | 14.21 | 13.88 | 14.17 |
| Total Non-Bell..... | 8.61 | 9.22 | 10.37 | 9.32 | 7.86 | 8.50 | 9.43 | 8.63 | 12.19 | 12.50 |
| Total Southwestern District..... | 8.39 | 9.09 | 10.20 | 10.43 | 8.31 | 10.43 | 12.45 | 13.19 | 13.80 | 14.09 |
| GRAND TOTALS FOR ALL DISTRICTS | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 8.05 | 9.13 | 9.27 | 8.42 | 7.75 | 9.10 | 9.95 | 9.70 | 10.00 | 10.66 |
| Non-Bell..... | 8.48 | 9.31 | 10.20 | 10.15 | 8.45 | 7.88 | 8.73 | 9.53 | 10.89 | 11.52 |
| All A Companies..... | 8.08 | 9.14 | 9.33 | 8.53 | 7.81 | 9.02 | 9.87 | 9.70 | 10.04 | 10.69 |
| B Companies | | | | | | | | | | |
| Bell..... | 5.33 | 5.93 | 7.32 | 8.65 | 8.13 | 7.67 | 8.86 | 9.96 | 11.04 | 11.01 |
| Non-Bell..... | 7.24 | 7.21 | 7.97 | 8.50 | 7.73 | 8.66 | 9.80 | 10.35 | 10.43 | 11.10 |
| All B Companies..... | 6.63 | 6.86 | 7.82 | 8.54 | 7.82 | 8.46 | 9.62 | 10.28 | 10.54 | 11.09 |
| C Companies | | | | | | | | | | |
| Bell..... | 5.96 | 6.55 | 8.31 | 8.18 | 7.81 | 9.17 | 10.57 | 10.49 | 10.52 | 9.34 |
| Non-Bell..... | 6.73 | 6.95 | 8.63 | 7.81 | 7.10 | 8.22 | 8.91 | 8.93 | 8.86 | 9.84 |
| All C Companies..... | 6.53 | 6.84 | 8.54 | 7.89 | 7.21 | 8.37 | 9.23 | 9.21 | 9.12 | 9.76 |
| Total Bell..... | 8.01 | 9.08 | 9.25 | 8.42 | 7.76 | 9.09 | 9.95 | 9.71 | 10.01 | 10.65 |
| Total Non-Bell..... | 7.93 | 8.45 | 9.36 | 9.40 | 8.12 | 8.10 | 8.98 | 9.64 | 10.44 | 11.17 |
| Grand Total..... | 8.00 | 9.02 | 9.26 | 8.51 | 7.80 | 8.99 | 9.85 | 9.71 | 10.04 | 10.69 |

obtained for the Northwestern and Southwestern districts in illustration:

Northwestern district—

$$\frac{\text{Tax}}{\text{Operating Revenue}} = 6.27\% =$$

$$\frac{1.83 \text{ (Per Cent of Tax to Investment)}}{29.19 \text{ (Capital Turnover)}}$$

Southwestern district—

$$\frac{\text{Tax}}{\text{Operating Revenue}} = 9.09\% =$$

$$\frac{2.64 \text{ (Per Cent of Tax to Investment)}}{29.04 \text{ (Capital Turnover)}}$$

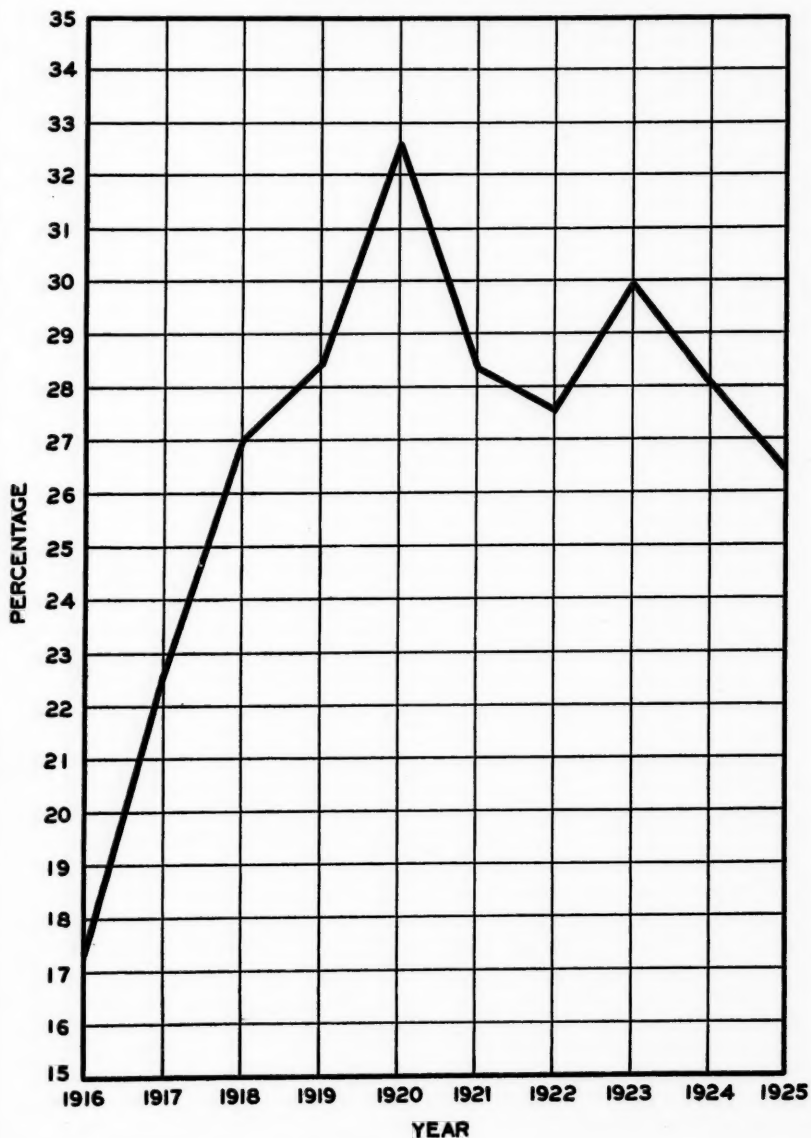
By inspection of this formula it appears that the difference in the ratio of taxes to revenue, from 6.27% to 9.09%, is principally due to the fact that there is a wide difference in the percentage of taxes to investment (1.83% and 2.64%) and that the capital turnover in these two districts, being quite similar (29.19% and 29.04%), has little influence. In districts or classes where there is more variation in the capital turnover, the

rate of turnover would have more effect in modifying the result.

Fluctuations in the ratio of taxes to operating revenue are obviously due to changes in one of the two items, but by applying the relationship which has been pointed out between the percentages of taxes to investment, capital turnover, and operating revenues, it may be shown that the percentage of taxes to investment may be rising steadily while the ratio of taxes to operating revenue may show fluctuations. In other words, when the investment is more fully utilized the result would be higher revenue in proportion to the investment; hence the burden of taxes on operating revenue would be less than under a smaller revenue in proportion to the investment. Thus with increased use or with higher relative rates, the tax burden is correspondingly less on this basis.

Chart II

THE RATIO OF TAXES TO OPERATING INCOME BEFORE
TAXES FOR ALL CLASS A, B, AND C TELEPHONE
COMPANIES FROM 1916 - 1925



MEASURES OF TELEPHONE UTILITY TAXATION

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TABLE III. PERCENTAGE OF TAXES ASSIGNABLE TO OPERATIONS TO OPERATING INCOME BEFORE TAXES FOR CLASS A, B, AND C BELL AND NON-BELL TELEPHONE COMPANIES, BY DISTRICTS, 1916-1925

| Classification | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|----------------------------------|--------|--------|-------|---------|-------|-------|-------|-------|-------|-------|
| EASTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 16.55 | 22.55 | 26.08 | 24.96 | 35.62 | 26.20 | 27.21 | 28.19 | 26.24 | 24.43 |
| Non-Bell..... | 15.17 | 18.66 | 20.34 | 20.20 | 25.24 | 22.68 | 20.23 | 18.43 | 19.95 | 20.58 |
| Total A Companies..... | 16.45 | 22.27 | 25.65 | 25.05 | 34.54 | 26.07 | 26.92 | 27.74 | 25.96 | 24.28 |
| B Companies | | | | | | | | | | |
| Bell..... | 15.71 | 17.71 | 22.85 | 22.69 | 24.60 | 21.85 | 21.07 | 21.91 | 23.04 | 25.47 |
| Non-Bell..... | 12.85 | 15.65 | 18.83 | 27.29 | 26.70 | 30.64 | 29.35 | 28.27 | 29.38 | 26.83 |
| Total B Companies..... | 13.24 | 15.90 | 19.31 | 26.37 | 26.23 | 28.51 | 27.35 | 26.91 | 27.53 | 26.49 |
| C Companies | | | | | | | | | | |
| Bell..... | 24.30 | 26.98 | 30.72 | 34.58 | 15.56 | 25.53 | 25.28 | 24.07 | 26.29 | 23.97 |
| Non-Bell..... | 17.64 | 18.34 | 29.05 | 23.73 | 25.54 | 26.83 | 24.90 | 27.77 | 29.21 | 30.20 |
| Total C Companies..... | 18.95 | 20.16 | 29.56 | 26.23 | 22.58 | 26.49 | 25.01 | 26.66 | 28.54 | 33.61 |
| Total Bell..... | 16.57 | 22.54 | 26.09 | 24.98 | 35.38 | 26.16 | 27.16 | 28.13 | 26.21 | 24.43 |
| Total Non-Bell..... | 14.94 | 17.89 | 20.65 | 26.21 | 25.58 | 25.70 | 23.41 | 22.47 | 23.48 | 23.79 |
| Total Eastern District..... | 16.40 | 22.06 | 25.50 | 25.10 | 33.99 | 26.14 | 26.90 | 27.70 | 26.02 | 24.40 |
| SOUTHERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 20.60 | 24.56 | 30.83 | 40.43 | 34.85 | 32.81 | 30.06 | 30.31 | 31.41 | 31.55 |
| Non-Bell..... | 15.00 | 17.98 | 20.65 | 28.23 | 27.40 | 27.11 | 23.93 | 27.54 | 24.73 | 24.55 |
| Total A Companies..... | 20.33 | 24.24 | 30.17 | 39.47 | 34.44 | 32.49 | 29.70 | 30.12 | 31.10 | 31.26 |
| B Companies | | | | | | | | | | |
| Bell..... | 12.73 | 17.02 | 23.86 | 30.55 | 26.50 | 27.52 | 27.14 | 39.54 | 42.58 | 43.11 |
| Non-Bell..... | 11.88 | 20.11 | 24.07 | 27.05 | 25.22 | 20.40 | 23.18 | 23.27 | 26.70 | 21.34 |
| Total B Companies..... | 12.24 | 18.78 | 23.97 | 29.11 | 25.65 | 22.66 | 23.94 | 25.65 | 28.98 | 33.70 |
| C Companies | | | | | | | | | | |
| Bell..... | 13.60 | 17.56 | 31.63 | 29.95 | 28.37 | 31.94 | 27.35 | 27.82 | 24.97 | ..... |
| Non-Bell..... | 14.17 | 16.42 | 23.29 | 26.85 | 29.08 | 30.95 | 24.32 | 22.78 | 20.72 | 26.24 |
| Total C Companies..... | 14.06 | 16.61 | 24.00 | 27.11 | 29.01 | 31.03 | 24.56 | 23.24 | 21.12 | 26.24 |
| Total Bell..... | 20.39 | 24.36 | 30.64 | 40.21 | 34.74 | 32.77 | 30.05 | 30.33 | 31.43 | 31.58 |
| Total Non-Bell..... | 13.78 | 18.52 | 21.97 | 27.88 | 27.33 | 26.37 | 23.89 | 26.31 | 24.47 | 23.57 |
| Total Southern District..... | 19.83 | 23.85 | 29.72 | 38.81 | 34.08 | 32.23 | 29.53 | 29.97 | 30.94 | 31.07 |
| CENTRAL DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 22.30 | 30.21 | 36.73 | 39.34 | 47.10 | 32.47 | 30.42 | 31.04 | 34.34 | 31.71 |
| Non-Bell..... | 19.39 | 19.97 | 21.98 | 24.33 | 28.20 | 28.56 | 23.23 | 23.10 | 26.31 | 24.79 |
| Total A Companies..... | 22.11 | 29.40 | 35.43 | 38.04 | 45.20 | 32.28 | 30.03 | 30.74 | 34.01 | 31.44 |
| B Companies | | | | | | | | | | |
| Bell..... | 12.69 | 20.47 | 31.54 | 35.81 | 19.08 | 16.51 | 22.49 | 23.07 | 31.44 | 38.63 |
| Non-Bell..... | 13.74 | 15.06 | 23.82 | 26.05 | 24.34 | 23.39 | 23.06 | 21.99 | 24.59 | 23.54 |
| Total B Companies..... | 13.57 | 15.77 | 24.79 | 27.07 | 23.54 | 22.81 | 23.02 | 22.09 | 24.93 | 33.91 |
| C Companies | | | | | | | | | | |
| Bell..... | 13.46 | 18.34 | 26.96 | 37.21 | 25.56 | 38.01 | 32.91 | 32.82 | 33.32 | 31.25 |
| Non-Bell..... | 11.07 | 12.71 | 19.30 | 24.43 | 28.24 | 28.75 | 22.65 | 24.65 | 21.37 | 19.90 |
| Total C Companies..... | 11.92 | 13.87 | 20.89 | 26.05 | 27.73 | 30.38 | 24.39 | 25.63 | 22.88 | 21.52 |
| Total Bell..... | 22.15 | 29.99 | 36.56 | 39.30 | 46.50 | 32.43 | 30.41 | 31.01 | 34.33 | 31.72 |
| Total Non-Bell..... | 15.64 | 16.69 | 21.92 | 24.89 | 26.92 | 26.66 | 23.07 | 22.93 | 24.67 | 23.45 |
| Total Central District..... | 21.26 | 27.84 | 34.06 | 36.97 | 42.85 | 31.85 | 29.63 | 30.21 | 33.39 | 30.95 |
| WESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 17.83 | 21.39 | 27.13 | 29.12 | 29.19 | 30.14 | 30.19 | 78.02 | 29.53 | 27.56 |
| Non-Bell..... | 10.35 | 26.05 | 14.64 | 12.71 | 16.71 | 21.05 | 22.94 | 22.50 | 19.49 | 22.75 |
| Total A Companies..... | 17.75 | 21.40 | 26.99 | 28.62 | 28.76 | 29.82 | 29.92 | 72.20 | 29.04 | 27.36 |
| B Companies | | | | | | | | | | |
| Bell..... | * | 122.57 | 74.51 | 39.06 | 52.70 | * | 30.24 | 25.22 | * | * |
| Non-Bell..... | 16.12 | 14.90 | 27.74 | 21.26 | 21.71 | 25.47 | 22.19 | 21.55 | 25.12 | 26.56 |
| Total B Companies..... | 18.92 | 18.48 | 30.74 | 32.00 | 28.78 | 28.28 | 22.70 | 23.15 | 27.44 | 29.59 |
| C Companies | | | | | | | | | | |
| Bell..... | 518.37 | 190.85 | * | 1524.45 | 70.16 | 67.94 | 85.15 | 45.59 | 54.03 | 25.17 |
| Non-Bell..... | 14.71 | 19.05 | 22.11 | 28.75 | 25.51 | 36.26 | 41.65 | 21.04 | 22.50 | 18.62 |
| Total C Companies..... | 16.55 | 21.70 | 24.47 | 32.61 | 27.85 | 39.02 | 45.43 | 26.94 | 27.09 | 20.08 |
| Total Bell..... | 17.98 | 21.53 | 27.27 | 29.37 | 29.32 | 30.24 | 30.24 | 77.92 | 29.60 | 27.61 |
| Total Non-Bell..... | 14.70 | 18.98 | 23.08 | 19.62 | 19.82 | 24.87 | 25.20 | 22.10 | 21.00 | 23.42 |
| Total Western District..... | 17.76 | 21.39 | 27.04 | 28.75 | 28.75 | 29.90 | 29.91 | 29.12 | 29.00 | 27.34 |
| NORTHWESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell..... | 13.30 | 17.90 | 22.84 | 22.48 | 25.49 | 25.90 | 22.73 | 22.34 | 21.80 | 19.14 |
| Non-Bell..... | 11.33 | 15.01 | 16.40 | 22.08 | 21.07 | 24.37 | 18.90 | 20.34 | 21.98 | 21.54 |
| Total A Companies..... | 12.77 | 17.19 | 21.11 | 22.54 | 24.32 | 25.50 | 21.68 | 21.81 | 21.85 | 19.79 |
| B Companies | | | | | | | | | | |
| Bell..... | 18.10 | 47.14 | 59.27 | 29.33 | 32.32 | 54.48 | 53.75 | 36.16 | 39.74 | 35.60 |
| Non-Bell..... | 15.19 | 16.21 | 24.36 | 18.40 | 24.12 | 20.53 | 22.55 | 20.52 | 19.22 | 22.41 |
| Total B Companies..... | 17.36 | 25.21 | 37.78 | 24.91 | 26.25 | 25.18 | 26.81 | 22.98 | 21.99 | 24.30 |
| C Companies | | | | | | | | | | |
| Bell..... | 14.33 | 16.88 | 28.09 | 24.31 | 22.91 | 21.77 | 25.80 | 29.99 | 31.74 | 26.72 |
| Non-Bell..... | 12.46 | 13.19 | 14.30 | 23.29 | 17.79 | 20.14 | 20.70 | 21.36 | 22.24 | 21.06 |
| Total C Companies..... | 13.17 | 14.44 | 17.01 | 23.54 | 18.35 | 20.28 | 21.75 | 22.49 | 23.29 | 21.46 |
| Total Bell..... | 13.47 | 18.07 | 23.18 | 22.62 | 25.52 | 25.99 | 22.85 | 22.43 | 21.91 | 19.21 |
| Total Non-Bell..... | 11.53 | 14.89 | 16.41 | 22.66 | 20.81 | 23.60 | 19.25 | 20.46 | 21.89 | 21.53 |
| Total Northwestern District..... | 12.93 | 17.22 | 21.20 | 22.64 | 24.16 | 25.27 | 21.70 | 21.85 | 21.90 | 19.90 |

*Deficit.

TABLE III (Continued). PERCENTAGE OF TAXES ASSIGNABLE TO OPERATIONS TO OPERATING INCOME BEFORE TAXES FOR CLASS A, B, AND C BELL AND NON-BELL TELEPHONE COMPANIES, BY DISTRICTS, 1916-1925

| Classification | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| SOUTHWESTERN DISTRICT | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell | 18.51 | 24.39 | 29.46 | 31.19 | 29.54 | 29.21 | 26.75 | 27.66 | 28.12 | 26.52 |
| Non-Bell | 12.67 | 15.78 | 19.00 | 19.94 | 20.58 | 20.05 | 20.18 | 17.74 | 23.95 | 20.92 |
| Total A Companies | 17.15 | 22.56 | 27.36 | 29.36 | 27.33 | 27.46 | 25.61 | 26.26 | 28.04 | 26.36 |
| B Companies | | | | | | | | | | |
| Bell | 12.24 | 15.82 | 12.59 | 36.66 | 36.56 | 32.30 | 36.82 | 33.42 | 26.36 | 26.36 |
| Non-Bell | 7.97 | 10.89 | 14.08 | 18.23 | 19.11 | 23.24 | 23.10 | 22.05 | 18.92 | 20.53 |
| Total B Companies | 9.35 | 12.43 | 14.08 | 17.75 | 23.06 | 25.74 | 25.19 | 24.97 | 21.95 | 21.54 |
| C Companies | | | | | | | | | | |
| Bell | 17.23 | 20.25 | 19.81 | 16.81 | 11.23 | 10.17 | 9.23 | 9.83 | 11.33 | ..... |
| Non-Bell | 9.68 | 14.92 | 24.84 | 23.69 | 32.53 | 41.28 | 34.09 | 30.05 | 24.43 | 21.52 |
| Total C Companies | 11.83 | 15.98 | 23.68 | 22.08 | 29.61 | 36.49 | 29.44 | 27.26 | 23.80 | 21.52 |
| Total Bell | 18.38 | 24.21 | 29.38 | 31.02 | 29.59 | 29.24 | 26.78 | 27.71 | 28.15 | 26.52 |
| Total Non-Bell | 11.96 | 15.16 | 18.89 | 19.97 | 20.89 | 21.17 | 20.99 | 18.81 | 21.45 | 20.89 |
| Total Southwestern District | 16.69 | 21.96 | 26.84 | 28.87 | 27.18 | 27.47 | 25.62 | 26.23 | 27.81 | 26.21 |
| GRAND TOTALS FOR ALL DISTRICTS | | | | | | | | | | |
| A Companies | | | | | | | | | | |
| Bell | 17.97 | 23.49 | 28.09 | 29.09 | 34.33 | 28.79 | 28.16 | 30.98 | 28.62 | 26.78 |
| Non-Bell | 14.26 | 17.60 | 19.35 | 23.63 | 23.29 | 23.19 | 20.73 | 20.45 | 21.90 | 21.95 |
| All A Companies | 17.65 | 22.97 | 27.27 | 28.59 | 33.06 | 28.39 | 27.60 | 30.10 | 28.24 | 26.53 |
| B Companies | | | | | | | | | | |
| Bell | 15.50 | 20.42 | 29.09 | 29.88 | 28.30 | 27.03 | 25.41 | 27.24 | 28.20 | 30.63 |
| Non-Bell | 12.96 | 15.47 | 20.90 | 24.97 | 24.53 | 25.69 | 25.22 | 24.27 | 25.38 | 24.30 |
| All B Companies | 13.52 | 16.40 | 22.20 | 25.93 | 25.35 | 25.92 | 25.25 | 24.72 | 25.87 | 25.11 |
| C Companies | | | | | | | | | | |
| Bell | 19.28 | 22.34 | 28.98 | 31.93 | 20.55 | 29.35 | 28.04 | 27.15 | 29.82 | 26.34 |
| Non-Bell | 14.08 | 15.73 | 22.46 | 24.83 | 26.13 | 28.22 | 25.63 | 24.95 | 24.14 | 25.60 |
| All C Companies | 15.04 | 17.04 | 23.81 | 26.04 | 25.06 | 28.42 | 26.13 | 25.37 | 25.00 | 25.70 |
| Total Bell | 17.96 | 23.46 | 28.10 | 29.11 | 34.21 | 28.79 | 28.15 | 30.95 | 28.62 | 26.79 |
| Total Non-Bell | 13.96 | 16.88 | 20.10 | 24.05 | 23.84 | 22.20 | 21.83 | 23.05 | 22.95 | 22.95 |
| Grand Total | 17.45 | 22.61 | 27.01 | 28.46 | 32.60 | 28.32 | 27.51 | 29.92 | 28.14 | 26.48 |

The ratio of taxes to operating revenue by districts. The trend of the ratios of taxes to operating revenue by districts corresponds fairly closely to that for the whole country over the 10-year period. A comparison of the 1925 data in Table I for the six districts shows, however, a wide divergence between some of the districts. For 1925, the percentages of taxes to operating revenues are compared with the corresponding percentages of taxes to investment and capital turnover and are summarized in Table IV.

From this table it will be seen that the Eastern and Northwestern districts have the lowest tax burden on revenues and have a correspondingly low rate of taxes related to investment. Differences in the capital turnovers in these two districts are reflected in the greater relative difference in the ratio of taxes to operating revenues as compared with

the difference in the percentages of taxes to investment.

The ratio of taxes to operating revenue for Bell and non-Bell companies. The tax burden measured as a percentage of revenue for all Bell companies was noticeably higher than for non-Bell companies in all years except 1919. In 1925 the Bell companies had a ratio of taxes to operating revenue of 7.57% as compared with the ratio of 7.48% for the non-Bell companies (Table V).

Taxes as related to investment are also higher for Bell companies than for non-Bell companies, 2.15% and 1.96%, respectively. If federal taxes are eliminated, the ratio of state and local taxes to investment is 1.73% for Bell companies and 1.25% for non-Bell companies. The last two percentages are based, for the most part, on *ad valorem* taxes on property, but they

TABLE IV. COMPARISON OF TAX BURDENS OF TELEPHONE COMPANIES, BY DISTRICTS, 1925

| District | Taxes to Operating Revenue | Taxes to Investment | Operating Revenue to Investment |
|--------------------|----------------------------|---------------------|---------------------------------|
| Southwestern..... | 9.09% | 2.64% | 29.04% |
| Southern..... | 8.94 | 2.68 | 29.98 |
| Central..... | 8.72 | 2.72 | 31.19 |
| Western..... | 8.25 | 2.18 | 26.42 |
| Eastern..... | 6.51 | 1.77 | 27.19 |
| Northwestern..... | 6.27 | 1.83 | 29.19 |
| All districts..... | 7.56 | 2.14 | 28.31 |

are also influenced by some state income and gross earnings taxes.

Of the total taxes paid by Class A and B Bell companies in 1925, 25.4% were federal taxes, compared with a similar figure of 34.9% for the non-Bell group. Thus property taxes are of greater relative importance to the Bell group.

Although the ratio of taxes to revenue for all Bell companies was higher than for the non-Bell companies, the three classes, A, B, and C, contrary to expectation, show no very consistent relationship to one another. For instance, in the B class, Bell companies are lower in 1916 and 1917 and again in 1921 and 1922. However, the companies in Class B, both Bell and non-Bell, are about the same size. Likewise the class C companies do not differ greatly in size. On the other hand, the average size of a Class A Bell company is about 20 times that of a Class A non-Bell company. Class A Bell companies have, therefore, by far the greatest weight in the percentages given for the whole country. Table V shows that in 1925 each class of Bell company paid a higher percentage of taxes related to investment than the non-Bell companies of the comparable class.

The fact that, in general, taxes are higher in the urban centers than in the rural districts is a factor tending to make the percentage of taxes to revenues higher for Class A companies,

which are usually located in the larger cities. Graduated gross earnings taxes, as in Maine, Wisconsin, and other states, might also be a minor factor accounting for a high percentage of taxes to revenue.

The capital turnover for Bell companies is higher than for the non-Bell companies. As previously pointed out, the ratio of taxes to operating revenues varies inversely as the capital turnover. The fact that non-Bell companies have a slower turnover than Bell companies would tend, therefore, to make the ratio of taxes to revenue higher. Thus without variation in capital turnover the differences in percentages of taxes to revenues would be more marked.

Ratio of Taxes to Operating Expenses

The ratio of taxes to operating expenses related to the ratio of taxes to operating revenue. The ratios of taxes to operating expenses and of taxes to operating revenues for the 10-year period naturally show approximately the same trends. Changes in their relative positions vary with operating conditions from year to year; that is, changes in the relative position of these two ratios can be traced to a change in the operating ratio from period to period for one class or district or for various classes and districts at the same point of time.

To show by simple mathematics the relationship of the operating ratio to these two tax ratios, the first tax ratio may be divided by the second and the result will be the operating ratio. Thus:

$$\frac{\frac{\text{Tax}}{\text{Operating Revenue}}}{\frac{\text{Tax}}{\text{Operating Revenue}}} = \frac{\frac{\text{Tax}}{\text{Operating Expense}}}{\frac{\text{Tax}}{\text{Operating Expense}}} = \frac{\text{Operating Expense}}{\text{Operating Revenue}}$$

Canceling the tax item, the result as shown above is:

$$\frac{\text{operating expense}}{\text{operating revenue}}$$

and this is the operating ratio.

From this it follows that if any of the figures from Table I for a given time and classification are divided by a corresponding figure from Table II, the result is the operating ratio. For example, the percentages from Table I and Table II may be taken for the Eastern district for 1921 and 1922:

1921, Eastern district—

$$\frac{\frac{\text{Tax}}{\text{Revenue}}}{\frac{\text{Tax}}{\text{Expense}}} = \frac{6.23}{8.21} = 75.9\% \text{ (Operating Ratio)}$$

1922, Eastern district—

$$\frac{\frac{\text{Tax}}{\text{Revenue}}}{\frac{\text{Tax}}{\text{Expense}}} = \frac{6.66}{8.91} = 74.7\% \text{ (Operating Ratio)}$$

The two operating ratios obtained by this method check with the operating ratio found by the more direct and usual method of dividing the actual amount of expenses by the amount of revenue.

In the above example the tax burden on the revenues increased from 6.23% to 6.66%, which is an increase of 6.9%; the burden on expenses increased from 8.21% to 8.91%, or 8.5% over the previous year. Thus the tax burden

on expenses increased at a more rapid rate than that on revenue. It is also to be noted that the operating ratio declined 1.5%. Or if two different districts are considered in a similar manner for the same year, the relationships would be:

1925, Eastern district—

$$\frac{\frac{\text{Tax}}{\text{Operating Revenue}}}{\frac{\text{Tax}}{\text{Operating Expense}}} = \frac{6.51}{8.94} = 72.8\% \text{ (Operating Ratio)}$$

1925, Southern district—

$$\frac{\frac{\text{Tax}}{\text{Operating Revenue}}}{\frac{\text{Tax}}{\text{Operating Expense}}} = \frac{8.94}{12.88} = 69.4\% \text{ (Operating Ratio)}$$

The ratio of taxes to operating expenses for the Southern district is 44.1% larger than the same ratio for the Eastern district. On the other hand, the Southern district's ratio of taxes to operating revenue is only 37.3% higher than that for the Eastern district. As would be expected, a smaller operating ratio is shown for the Southern than for the Eastern district.

Generalizing from these two illustrations, it may be said that if the ratio of taxes to operating expenses is increasing more rapidly than the ratio of taxes to operating revenue, this indicates a declining operating ratio, and *vice versa*. This relationship may be applied further in analyzing Tables I and II. The present analysis does not attempt to explain the differences in operating ratios among classes of companies or in various years, because many factors, such as business conditions and operating efficiency, enter the problem; but it simply points out the relationship which exists between the operating ratio and the tax-to-revenue and tax-to-expense ratios.

Both the ratio of taxes to operating revenue and the ratio of taxes to operating expense show a marked drop in

TABLE V. TAX RATIOS OF BELL TELEPHONE AND NON-BELL TELEPHONE COMPANIES, BY CLASSES, 1925

| Class of Company | Taxes to Operating Revenue | Taxes to Investment | Operating Revenue to Investment |
|---------------------|----------------------------|---------------------|---------------------------------|
| A Bell..... | 7.57% | 2.15% | 28.40% |
| A non-Bell..... | 7.52 | 1.92 | 25.53 |
| All A companies.. | 7.50 | 2.14 | 28.30 |
| B Bell..... | 8.07 | 2.46 | 30.48 |
| B non-Bell..... | 7.57 | 2.01 | 26.55 |
| All B companies.. | 7.65 | 2.07 | 27.06 |
| C Bell..... | 6.87 | 2.11 | 30.71 |
| C non-Bell..... | 7.10 | 2.07 | 29.15 |
| All C companies.. | 7.07 | 2.08 | 29.42 |
| Total Bell..... | 7.57 | 2.15 | 28.40 |
| Total non-Bell..... | 7.48 | 1.96 | 26.20 |
| Grand Total..... | 7.56 | 2.14 | 28.31 |

1920; the decline in taxes to expense is the more pronounced. From the generalization made above it may be inferred that operating ratios rose at that time. The facts bear this out. A high price level at that time was reflected in higher operating costs and hence in lower percentages of taxes to operating expense and in higher operating ratios.

Ratios of taxes to operating expenses by districts. The ratio of taxes to operating expenses, although following the general trends of the ratio of taxes to operating revenue, shows greater differences among districts as well as among periods. Expenses are more affected by the business conditions in the various localities and by the varying degrees of efficiency of the individual plant, and hence one would expect wider variations in the ratio of taxes to expenses than to revenues. Although the volume of business may change through efforts on the part of the company or through natural growth of the community, telephone rates are more stable than expenses. Expenses are more sensitive to local as well as to national business conditions than are revenues, and hence changes in this ratio would have to be interpreted in the light of conditions in many companies and districts.

Ratios of taxes to operating expenses of Bell and non-Bell companies. The percentages of taxes to operating expenses for Bell companies were higher than for non-Bell companies in 1916, 1917, 1921, 1922, and 1923, and lower in the other five years. As pointed out previously, the ratio of taxes to expenses is a function of the operating ratio, and further analysis of the operating ratio would not be possible or pertinent here, because of its dependence on many local conditions.

It may be noted, however, that operating ratios throughout the period of this study are higher for all Bell companies than for non-Bell companies.

The Ratio of Taxes to Operating Income Before Taxes

By districts. Operating income before taxes represents the difference between revenues and expenses including uncollectibles. The percentages of taxes to operating income will, therefore, vary as the business is more or less profitable, as well as with changes in the tax.

The districts retain about the same relative position that they held in the analysis of revenues and expenses. The Northwestern district is again low, and the Southern is high. In the year 1925 the burden was generally heavier than in 1916, but the three years from 1919 through 1921 show an unusually high ratio of taxes to operating income before taxes. This period of high prices, which was not accompanied by correspondingly higher rates, resulted in relatively lower operating incomes and hence higher percentages of taxes to operating income. The operating ratios evidence this. The Central district in 1920 had the abnormal operating ratio of 85%. Accordingly, companies in the Central district paid the highest percentage of taxes to operating income, 42.85% for 1920.

Ratios of taxes to operating income of Bell and non-Bell companies. One outstanding fact derived from the tables is that throughout the period the Bell companies show a higher percentage of taxes to operating income than the non-Bell companies. How may we account for this fact?

Bell companies in general have higher operating ratios than the companies out-

side the Bell System. Thus the mere fact of higher operating ratios accounts, in large part, for the higher burden in terms of taxes to operating income of the Bell companies. This is modified to some slight extent by the manner in which the Bell System may, by filing a consolidated report for the entire system, secure certain economies. This would tend to make the percentage of taxes to operating income less than if each company paid all its taxes independently. However, this is but a small factor. Moreover, federal taxes are only about a fourth of all taxes.

The Bell and non-Bell figures show similar peaks in 1919 and 1920, which correspond to those mentioned for the various districts. Except for Class C companies, the figures for which appear somewhat erratic, the non-Bell companies generally have a lower ratio than the Bell group. As pointed out, other things being equal, the lower the operating ratio, the lower the ratio of taxes to operating incomes.

Summary

As an aid in interpreting and comparing percentages in Tables I, II, and III, certain relationships may be noted:

1. The burden of taxes on operating revenues is affected not only by changing tax rates and amounts of revenue, but by the relationship of taxes and of operating revenue to the investment in plant and equipment. The ratio of taxes to operating revenue varies directly with the percentage of taxes to investment and indirectly with the capital turnover.

2. The ratio of taxes to expenses tends to follow the ratio of taxes to revenues. The ratio of taxes to revenues divided by the ratio of taxes to expenses is the operating ratio.

3. The ratio of taxes to operating income is peculiarly dependent on the profitableness of the business. The ratio of taxes to operating income, constant taxes being assumed, varies directly with the operating ratio.

The variable factors which are pertinent to the problem are the actual amounts of the three items involved; the kind of taxes; the relative amounts of each; and local conditions, such as operating efficiency, construction and operating costs for different groups, the stage and rapidity of development of the district, and the average size of companies in different groups.

The outstanding trends are:

1. The tax burden has gradually increased during the period from 1916 to 1925, that is, revenues have not increased so rapidly as taxes.

2. Bell companies as a whole have a higher percentage of taxes to revenues and to operating income than have the non-Bell companies.

3. All Class A companies have a higher percentage of taxes to operating income, and through 1923 had a higher percentage of taxes to operating revenue, than did Class B and C companies.

4. All Class A Bell companies, except in 1919, have a higher ratio of taxes to revenue and to operating income than Class A non-Bell companies. This is also true of Class B and Class C Bell companies except in 1920.

5. There was a drop in the general upward trend of the taxes to revenue and expense ratios in 1919 and 1920, the period of high prices. This is reflected in a peak in the trend of taxes to operating income during these years.

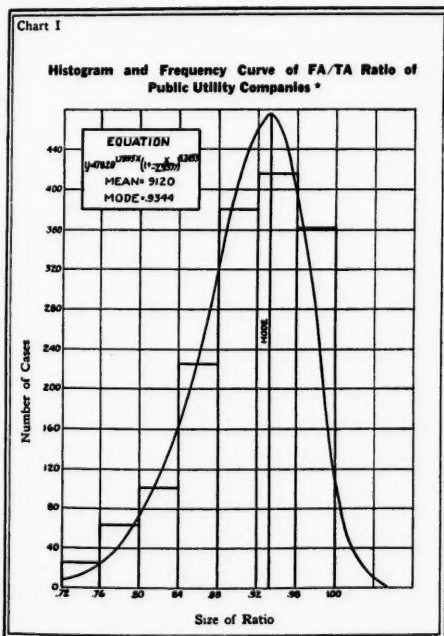
6. The six districts arranged in order of the size of the ratio of taxes to revenues over the past several years are Southwestern, Southern, Central, Western, Northwestern, Eastern.

A STUDY OF UTILITY FINANCIAL STRUCTURES: PROPERTY AND EQUITY RATIOS

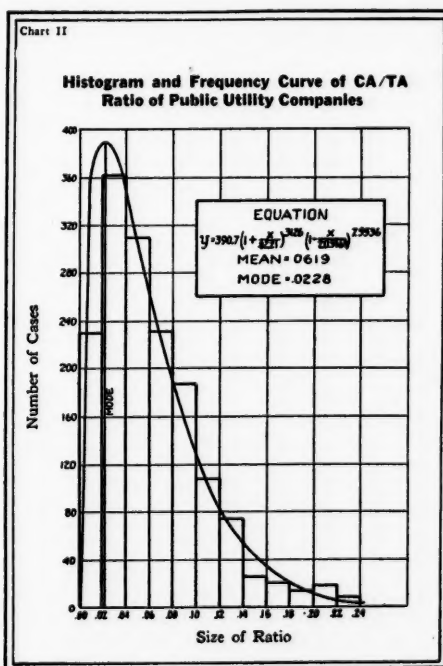
By A. E. PATTON AND O. GRESSENS

THE balance sheet of a corporation can be used for investigations more extensive than the periodic consideration of the financial position of the company. If a great number of balance sheets are gathered and classified according to the nature of the business of each company, the representative financial plans and structures of the several types of businesses can be approximately determined. The differences which occur in the distributions of the properties and equities, in so far as they represent fundamental

differences and not merely variations ascribable to local factors, such as the peculiarities of a narrowly circumscribed market or the differences of business policies, are rooted in the economic conditions peculiar to each type of business. A purely distributive business, for example, must necessarily invest the greatest portion of its capital in inventories and working capital; consequently the current assets of such a business present the most important asset element in such a plan. In a public utility, on the other hand, where services instead of commodities are marketed and where these



* The symbol FA/TA indicates the ratio of Fixed Assets to Total Assets. In all subsequent charts the ratios are similarly indicated by the initial letters of the balance sheet items.



services are at the same time produced by the company, the fixed investment is by far the most important asset element, and in comparison the current assets are of almost negligible proportions.

In considering a particular industry, it must be noted whether or not the properties and equities of the individual business units tend towards a representative distribution—in other words, whether the amounts invested in the several kinds of assets tend towards representative proportions of total assets, and, likewise, whether the amounts of borrowed capital, ownership capital, and other equity items tend toward typical proportions of total capital in the business.

In this study the appropriate data for the same companies considered in previous studies published in the *Journal* have been used.¹ The standardized *pro forma* balance sheet determined upon for this purpose appears as follows:²

| Assets | | Liabilities | |
|------------------|---------|--------------------------|---------|
| Fixed Assets... | x x x | Long-Term Debt | x x x |
| Current Assets.. | x x x | Current Liabilities..... | x x x |
| Other Assets... | x x x | Net Worth..... | x x x |
| | x x x x | | x x x x |

I. The Representative Distribution of the Properties for All the Public Utility Companies Considered

With Chart I is presented the distribution of the ratios of Fixed Assets to Total Assets for all the companies considered in this study.³ The typical ratio, as indicated by the mode of the

¹ See previous articles, "Studies of Utility Financial Structures," by the authors in the *Journal of Land and Public Utility Economics*, April, 1926; July, 1926; February, 1927; May, 1927.

² All outside investments have been eliminated from the balance sheets of the companies. The Net Worth here includes preferred stocks. For some purposes this definition of Net Worth would not be correct, but here it is desired to distinguish only

frequency curve, is approximately .93. In other words, when all these companies are considered together, an investment of 93% of Total Capital in Fixed Assets represents the point of concentration for these companies. The average investment in Fixed Assets, as indicated by the arithmetic mean, is 91% of Total Assets. A great number of variations from the representative figure, of course, are indicated by the distribution of Chart I. The ratio which can be called *representative*, however, is approximately .93.

between capital upon which periodical payments are mandatory and capital periodically earning dividends. In other words, the ordinary accounting definition of Net Worth has here been adopted. The equity strictly defined from a financial point of view includes only Common Stock and Surplus and Reserves.

³ It will be remembered that these companies include electric railway, gas, and electric light and power companies. The tables of data have been omitted from this article because of their length and number.

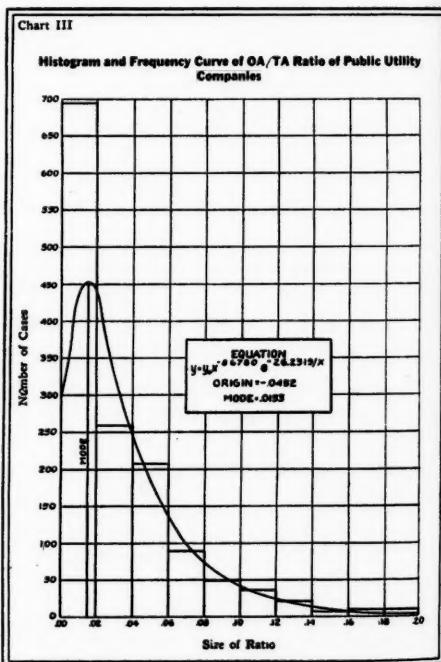
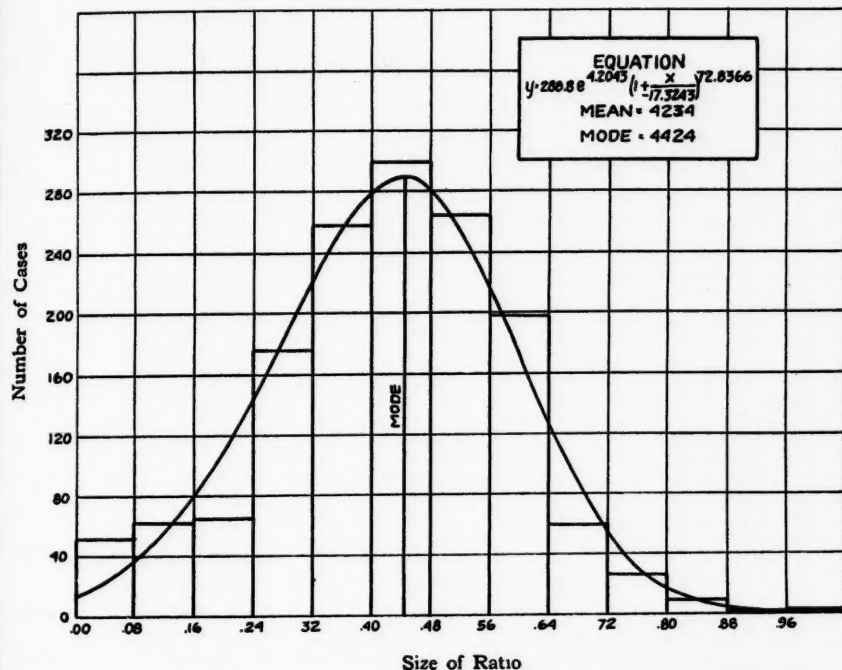


Chart IV

Histogram and Frequency Curve of LTD/TA Ratio of Public Utility Companies



From Chart II it can be seen that the representative ratio of the Current Assets to Total Assets is approximately .02. The concentration for this ratio occurs in the class interval .02-.04. The representative investment in current assets for public utility companies is thus comparatively low. This is also true of the investments in Other Assets, as can be seen from Chart III. The representative ratio as calculated from the frequency curve here is approximately .015, the concentration of the cases of this ratio occurring in the interval .00-.02. The distribution of the properties for gas, electric light and power, and traction companies considered together

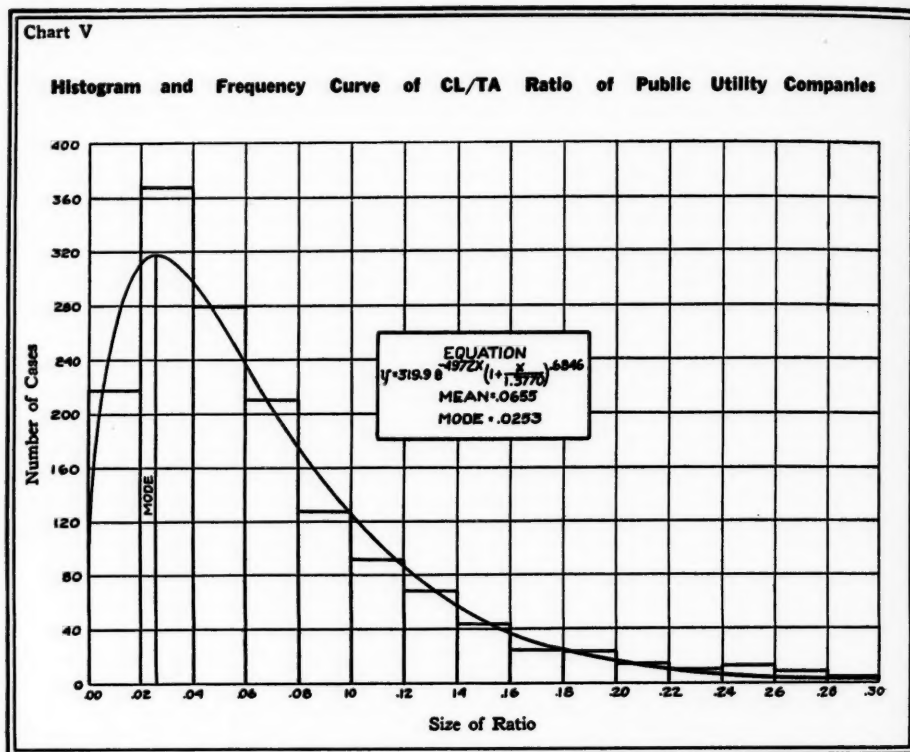
can thus be said to be approximately as follows:⁴

| | Class Interval | Calculated Representative Ratio |
|---------------------|----------------|---------------------------------|
| Fixed Assets..... | .92-.96 | .93 |
| Current Assets..... | .02-.04 | .02 |
| Other Assets..... | .00-.02 | .02 |

II. The Representative Distribution of the Equities for All the Public Utility Companies Considered

The representative amount of bor-

⁴The representative ratios total .97. The difference between .97 and 1.00, or .03, is ascribable



rowed capital which can be classified as Long-Term Debt is approximately 44% of the Total Capital. Again, Chart IV shows a considerable variation from this amount, but concentration of the respective ratios is definitely shown in the class interval .40-.48. In other words, in the typical case of the sample taken for this investigation, a public utility company borrows from 40% to 48% of its total permanent capital.

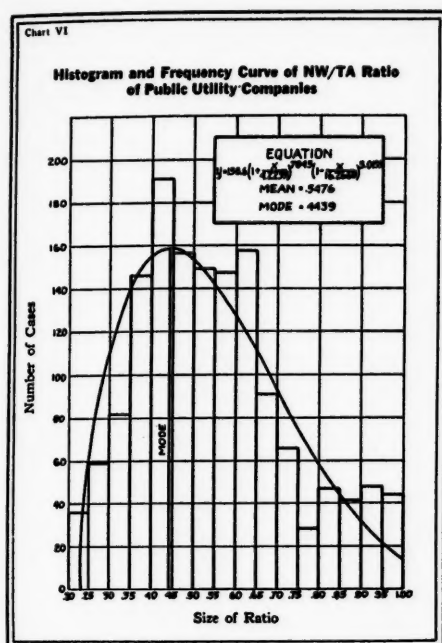
(Footnote 4 continued from page 401)

to the approximation necessary in the calculation of these ratios, and to the grouping of these ratios into class intervals to determine the representative ratio.

⁵ The latter ratio is determined from a somewhat scattered distribution. It is subject, therefore, to a considerably greater error than the other ratios here presented. The errors incident to approximation and classifications are, of course, present in all these ratios.

From Charts V and VI it is seen that the representative ratios of Current Liabilities to Total Capital and Net Worth to Total Capital are approximately .03 and .44 respectively.⁵ The representative distribution of the equities for all types of public utility companies, as determined from this sample, can therefore be stated in summary form as follows:

| | Class Interval | Calculated Representative Ratio |
|---|----------------|---------------------------------|
| Long-Term Debt..... | .40—.48 | .44 |
| Current Liabilities..... | .02—.04 | .03 |
| Net Worth (including common and preferred stocks and Surplus and Reserves)..... | .40—.45 | .44 |

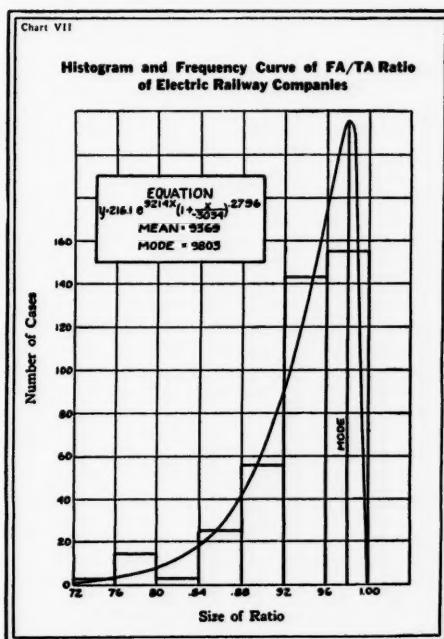


III. The Representative Financial Plan in Public Utility Companies

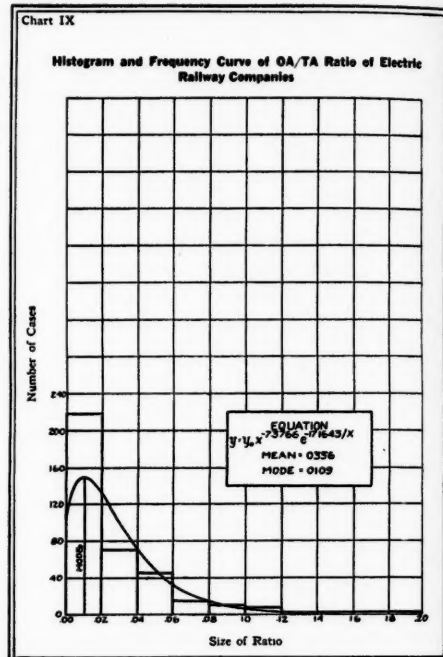
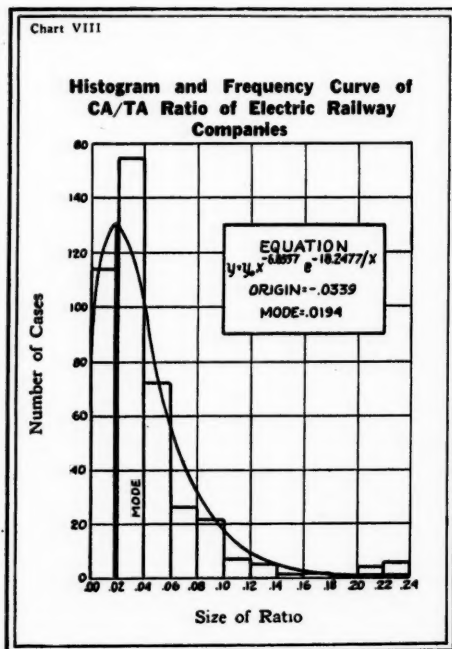
By far the greatest portion of the capital invested in operating assets in public utility companies is represented by investments in plant and equipment. The investment in all other operating assets amounts to only one-tenth or less of the total capital invested in these concerns. Current assets, considered from the point of view of the total properties, are a comparatively insignificant item on the balance sheet. There is however, a significant consideration to be taken into account in connection with these current items, and that is their immediate liquidity. Current assets such as accounts receivable that have deteriorated so that they are not immediately available to meet current liabilities will sooner or later be the cause of serious embarrassment. The importance of current assets in public utilities generally,

therefore, is found in their liquidity. From the point of view of capital "tied up" in them, they are a comparatively negligible item. The working capital in such a company is consequently a minor financial consideration. The emphasis here is transferred to the fixed investment. These considerations are rooted in the facts that a public utility company sells services rather than commodities and that the collections are usually strictly on a thirty-day basis. Inventories and accounts receivable are thus materially minimized. The characteristic distribution of properties in a public utility company is thus one in which fixed capital is by far the most important item on the balance sheet.

There is another characteristic of the public utility business which accounts for the distribution of the equities. From the point of view of this distribution, it can be noticed that Long-Term Debt represents a high proportion of the total



equities. The stability of this business over a period of years undoubtedly allows the acquisition of large proportions of the total capital on the part of a public utility company by borrowings. The assurance of stable returns constitutes a guaranty for periodical interest payments. Fluctuations in operating expenses, of course, form an important offset to regularity of returns, owing to fluctuations in prices. Regulation of rates, as is well known, destroys the resiliency which gross revenues might otherwise show towards price changes, but it cannot prevent sympathetic movements in operating expenses. The public utility business is, notwithstanding, a business of comparatively regular returns. It is fundamentally based on the sale of a necessity, not a luxury. A comparatively high proportion of total capital can therefore be acquired by borrowings. Increased development of industrial power will undoubtedly de-



crease this stability and introduce new financial problems.

It is interesting to compare this study with another similar investigation.⁶ In this latter study the balance sheet was classified as follows:

| Assets | Liabilities |
|------------------------------|--|
| Fixed Assets . . . x x x x | Long-Term |
| Investments in | Debt x x x x |
| Subsidiaries . . . x x x x | Non-Voting |
| Current Assets . . . x x x x | Stock x x x x |
| Other Assets . . . x x x x | Current Liabilities x x x x |
| | Voting Stock . . . x x x x |
| | Surplus and Reserves x x x x |

⁶ This study by O. Gressens and J. R. Ramser was published in the *Annalist*, Vol. 30, Nos. 757 and 761. It is based on an analysis of all (150) the underlying companies of five large public utility holding companies in the United States. The balance sheets used were for the year ending December 31, 1925.

The representative ratios of these items to total assets as determined by this latter study are as follows:

| | | | |
|---------------------|-----|-----------------------|-----|
| Fixed Assets..... | .91 | Long-Term Debt.. | .46 |
| Investments in Sub- | | Non-Voting Stock.. | .16 |
| sidiaries..... | .01 | Current Liabilities.. | .07 |
| Current Assets..... | .04 | Voting Stock..... | .23 |
| Other Assets..... | .04 | Surplus and Re- | |
| | | serves..... | .08 |

The similarity of these results, obtained by a different selection and from a *smaller* sample than the data used in the present study, is striking. When made comparable, the results are surprisingly close.⁷ The similarity of these results obtained in a different manner constitutes a powerful argument in favor of the contention that there is a *characteristic* financial plan and financial structure in the public utility industry.

⁷ The results of the two studies cannot, of course, be made strictly comparable, for in the present study only operating assets are included, while in the study cited above all assets, including outside investments, were included.

IV. The Representative Distributions of Properties and Equities by Kinds of Utility Companies

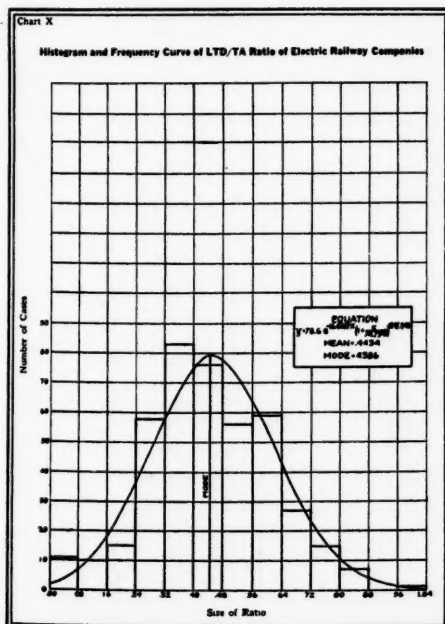
When the public utility companies are divided according to the kind of utility into (1) gas and electric light and power companies and (2) electric railways, the following representative distributions of the properties and equities are obtained:

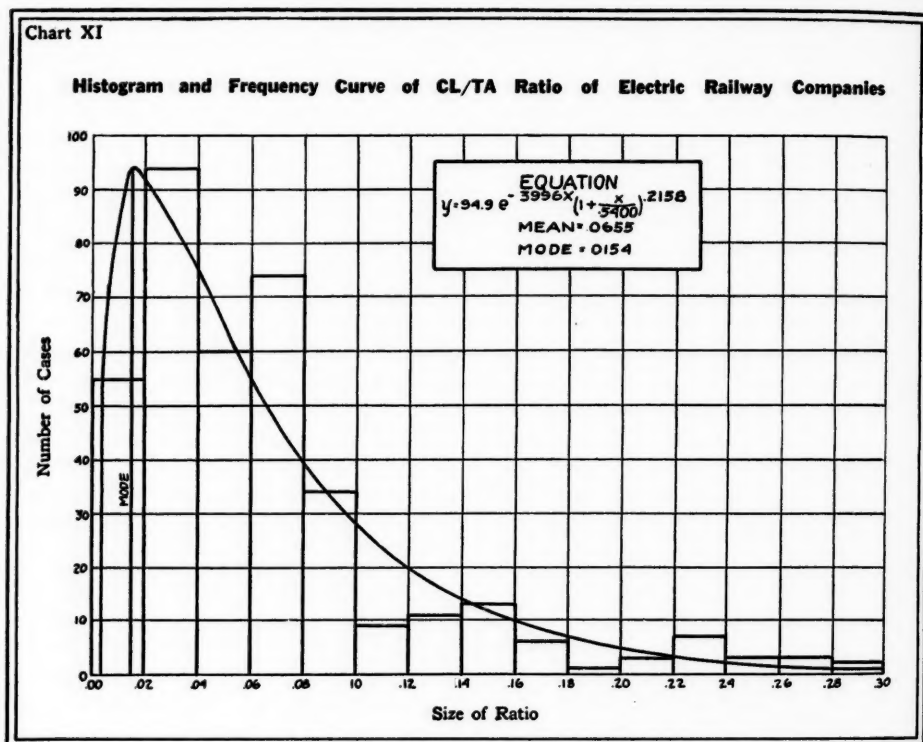
| | Gas and Electric Light and Power Companies | Electric Railways |
|------------------------|---|----------------------|
| ASSETS | | |
| Fixed Assets..... | .92 | .98 |
| Current Assets*..... | .05 | .02 |
| Other Assets..... | .02 | .02 |
| LIABILITIES | | |
| Long-Term Debt.... | .45 | .44 |
| Current Liabilities*.. | .03 | .03 |
| Net Worth..... | .49 | .49 |

* The ratios CA/TA and CL/TA are subject to considerable error because of the necessary approximations and groupings. The ratios, being small, are distorted by the errors incident to these manipulations. The current ratio, for example, cannot be determined from them, but must be determined independently from the original balance sheet figures, as was done in an earlier article. They show, nevertheless, the comparatively small proportions of these items among the properties and equities.

It can thus be seen that, although the respective distributions are little disturbed when the gas and electric light and power companies are separated,⁸ the distributions in the case of the electric railways show some characteristic differences. (See Charts VII-XII inclusive.) The investment in Fixed Assets is higher, and the Net Worth, as here defined, is wider. In general, however, the conclusions reached in discussing these distributions for all the companies considered together apply equally

⁸ For this reason the curves showing distribution of ratios of gas and electric light and power companies are omitted.





to the similar distributions by kind.⁹

V. Representative Distributions of Properties and Equities by the Size of Companies

In order to note whether or not any significant changes are introduced when the companies are divided according to size, the following three classifications were made, and the representative ratios for each classification determined:

1. Companies whose total operating assets aggregated between \$5,000,000 and \$10,000,000;
2. Companies whose total operating assets aggregated between \$10,000,000 and \$50,000,000;
3. Companies whose total operating assets exceeded \$50,000,000.

For these three classifications the

representative ratios as determined from the distributions are as follows:¹⁰

| | Class 1 | Class 2 | Class 3 |
|-----------------------|---------|---------|---------|
| ASSETS | | | |
| Fixed Assets..... | .95 | .93 | .93 |
| Current Assets..... | .02 | .03 | .02 |
| Other Assets..... | .01 | .01 | .02 |
| LIABILITIES | | | |
| Long-Term Debt... | .40 | .45 | .49 |
| Current Liabilities.. | .03 | .03 | .03 |
| Net Worth..... | .51 | .46 | .48 |

⁹ As was noted in a previous article, the gas and electric light and power companies are here grouped together owing to the fact that these two services are so often found in the same companies.

¹⁰ The charts for these respective distributions are not included.

Such variations as occur here cannot be called significant, and again, the conclusions reached in the first section of this study apply without variation. Significant differences do appear when individual companies are considered in comparison with these representative ratios. In most of those cases, however, such differences may be explained on the basis of the circumstances surrounding the individual companies. These representative ratios serve only the purpose of broadly characterizing the financial plans and structures of the utility business.

VI. General Summary

The salient points brought out by this investigation are:

1. Approximately nine-tenths or more of the capital invested in operating assets in public utility companies is invested in fixed assets.

2. The investment in working capital represents only a very small fraction of the total investment in operating assets.

3. The long-term debt in public utility companies is approximately equal to the equity when the equity is defined as including preferred stocks.

4. A separation of the public utility companies herein included by kind and size introduces no significant variations in the representative ratios of properties and equities.¹¹

5. A comparison with a similar study indicates that there is a definite tendency towards a representative financial plan and financial structure among public utility companies.¹²

In order to determine the character-

¹¹ Attention is again called to the fact that outside investments have been eliminated from these balance sheets. A comparison with a similar study in which these investments have been included, however, leads to the conclusion that the same

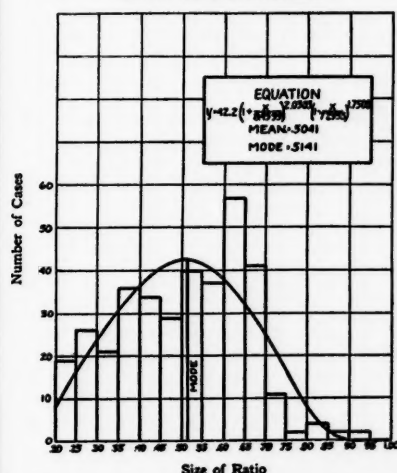
istic differences in the financial plans and structures, as well as all other important operating and financial ratios, a minute and careful classification of public utility companies must be made according to (1) hydro-electric companies, (2) steam generating electric light and power companies, (3) natural gas companies, (4) manufactured gas companies, (5) water companies, (6) telephone companies, (7) city electric railway companies, (8) interurban electric railway companies. In other words, such a classification would show the significant differences as between the various types of public utility companies, while the purpose of the present study is to characterize generally

generalizations hold true when all properties and investments of these companies are considered.

¹² The representative distributions by geographical location and by sample years have been omitted. As determined from this sample of public utility companies, no significant differences occur in them, so that the generalizations here offered apply equally well to them. This same fact was noted, with few exceptions, in previous studies published in this *Journal*.

Chart XII

Histogram and Frequency Curve of NW/TA Ratio of Electric Railway Companies



such public utilities as have been herein included.

Another line of investigation would necessitate a classification of the above named types according as they are (1) subsidiaries of a parent holding com-

pany, thus forming part of a system or (2) independent companies. Differences in financial policies, as they are reflected in the financial plans and structures of these companies, would thereby be readily recognized.

INTERMOUNTAIN AGRICULTURE AND PACIFIC COAST POPULATIONS

By W. E. LEONARD

IT IS frequently said and commonly believed that the problems of agriculture in the intermountain country are not unlike those found elsewhere in the nation. This belief is treacherously misleading. Farm problems there are essentially different from those in the Middle West or the South, and until these differences are fully recognized, the mountain country may not expect to make intelligent headway in developing its agricultural possibilities.

It is well, therefore, that attention be directed to some of these differences—differences which create problems of vital concern to the entire West—and to suggest that these problems call for a new policy in agriculture to affect all intermountain country.¹

Any analysis of agricultural questions leads to the conclusion that farmers face two kinds of problems. First are those fully within the power of farmers themselves to control. Among these are good judgment in management, a proper crop system, adequate cultivation and protection of soils, frugality, economy, and willing, neighborly cooperation. These matters farmers cannot and ought not to neglect. But there is a second class of problems in agriculture, and these are beyond the farmer's power to control either individually or collectively. Some of these may be mentioned: the general land policy, including the recla-

mation of land, the general marketing structure, transportation, and taxation. For all intermountain country these particular questions have a degree of importance not found in any other part of the nation. In the writer's opinion these problems are so difficult, so intricate, and have such a vital effect upon agricultural and industrial development generally that it is unwise to neglect them any longer.

The questions just referred to involve broad economic principles and policies. Very largely they fall in the field of public opinion, legislation, and administration. Since, in the nation as a whole and in each of the Pacific Coast states, farmers are in a hopeless minority, they are not free to make choices as to policy, nor have they the same opportunity to secure such legislation as they need. They must accept such policies and submit to such legislation as the dominant industrial and commercial interests may give them. It seems folly to say to farmers, as we often do, "Settle your own problems," when they have no adequate political or economic power to do so.

I. Some Present-Day Tendencies

First, however, there are some really significant facts about our mountain and coast regions which should challenge attention.

1. The population in the mountain and Pacific states is becoming urbanized at a rapid rate, perhaps even more rapidly than we are aware. In 1900, 46.4%

¹ The intermountain territory includes the following: Eastern Washington, eastern Oregon, eastern California, Idaho, Utah, Nevada, Arizona, western Montana, western Wyoming, western Colorado, and western New Mexico. See map on next page.

of the population of the three Pacific Coast states was urban; in 1920, the percentage rose to 62.4%. Since 1920 there is abundant evidence that this cityward tendency has continued, probably at a much accelerated rate. Agricultural population has dropped from 53.6% of the total in 1900 to 37.6% in 1920. If a census of the population of these states were available in 1927, it might be discovered that more than two-thirds of the people in this area live in cities and less than one-third in the country. This is a peculiar situation in a region as new as the West.

2. In the 20-year period ending in 1920, the total population of the Pacific Coast states increased 130%; but the urban population increased 209% and the rural, 62%. Put in another way, the urban population during this time increased from slightly over 1,000,000 to nearly 3,500,000, an increase of 2,359,000. The rural section of the population during this time increased only about 800,000. That is, urban population has multiplied three times as

TABLE I. PERCENTAGE INCREASES OF POPULATION AND AREA OF IMPROVED LAND IN CALIFORNIA, OREGON, AND WASHINGTON*

(Fractions omitted)

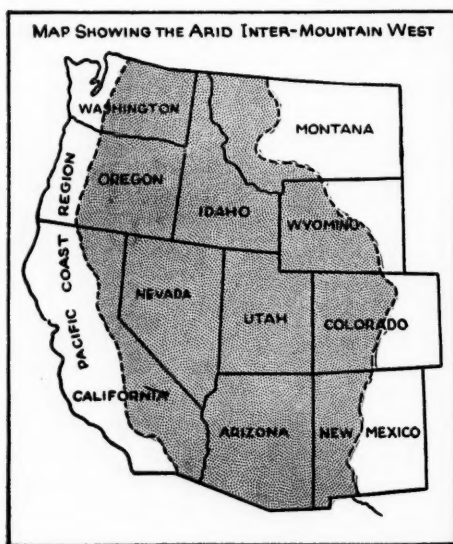
| | 1900 to 1910 | 1911 to 1920 | 1900 to 1920 |
|-----------------------|--------------------|--------------------|--------------------|
| Urban population..... | 112 | 46 | 209 |
| Rural population..... | 40 | 16 | 62 |
| Improved land..... | 18 | 9 | 27 |

*Data from United States Census.

fast as the rural. Table I contains a detailed account of population increases since 1900.

This cityward movement is greatest on or near the coast. Immigrating peoples steadily seek the "farthest west." To them the Pacific Coast means the tidewater country: Puget Sound, the Willamette Valley, the Sacramento, the Santa Clara and Los Angeles areas. Regions east of the Cascades and corresponding territory to the south have less appeal. There are few inland cities; only two of the 100,000 class are found in all the intermountain country—Salt Lake City and Spokane.

3. In the three Pacific Coast states in 1920 there was a total population of 5,500,000. Of these, 77% had their homes on the western seaboard, or near it; 23% in the eastern two-thirds or three-fourths of these states. The population is now approximately 6,250,000 in these states; in 1930 the census may show 7,000,000; in 1940, 8,500,000; probably in 1950, should present movements continue, the 10,000,000 mark may be reached. If 75% of these people live on or near seaboard territory, the social and economic problems arising 25 years hence will be pressing, to say the least.



4. From 1900 to 1910 the area of improved land in these states increased 18%; from 1910 to 1920, 9%. In this last period less than 2,000,000 acres were added. Of this land less than 500,000 acres were in seaboard territory; 1,500,000 acres were east of a line paralleling the Cascades. Improved land on the coast increased about 5%, and population in the same region more than 40%.

Again, it is interesting to note that in 1890 each inhabitant of these states had 9.2 acres of improved land; in 1900, 7.9 acres; in 1910, 5.5 acres, and in 1920, 4.3 acres, while the average citizen of the United States, in the last census year, had nearly 5 acres.

It should be clear that in the future coast lands will be devoted, even more than now, to the production of specialized fruits and of truck and dairy products. General farming will unquestionably shrink to smaller proportions. Moreover, as years pass, it is reasonable to expect that new lands will be brought into cultivation at a larger and larger cost. The former easy methods of putting land under plow have passed, and already the more easily available reclamation projects have been started.

5. The present and future situation of this area seems perfectly clear. In seaboard territory the agricultural population is increasing slowly, with small yearly additions of improved land; urban population is growing at an unprecedented rate, having nearly doubled in the last 10 years. East of the mountains, the agricultural population is not rapidly increasing, and the yearly additions of improved lands are being made more and more slowly. If these were merely temporary tendencies, there would be no reason for concern. But these movements have been in evidence for 20 years and are now more pro-

nounced than at any time in the past.

From this narrative of tendencies, it is apparent that between the growth of seaboard city population and improved acreage in the hinterland there is a rapidly growing disproportion. This disproportion is certain to become greater than it already is. From this fact will come the crucial question of the future: From what sources are the coast people to get their meats, cereals, and other foods?

The future of the coast country is destined to be industrial first, then commercial. This requires, among other things, sources for an abundant, unfailing cheap food supply—sources as prolific as those to which the industries of the Central and Middle Western states have access. If this supply is lacking, the Pacific Coast states can hardly expect to compete successfully with those states more fortunately situated. The latter draw food, cheaply produced, from lands of excellent and uniform quality, wide in extent and in close proximity to markets, and under favorable climatic conditions. In short, their industrial populations have access to low-cost foods. Since the industrial interests of the western coast must make provision for cheap foods, it seems desirable that they should become interested in the agricultural hinterland where a constructive policy is needed to handle the more difficult problems confronting the farmer.

II. Matters of Concern to Intermountain Farmers

1. *Land Policy.* We may now consider in greater detail some of the more significant aspects of agriculture in the intermountain country. First of all, there is the land policy of the United States. For more than 70 years we

have operated under the homestead laws, which were designed for situations wholly different from those found in the mountain regions. These laws, when applied to the middle west prairie country, for which they were made, might be expected to work in a satisfactory manner. On such land the only thing needed was a breaking plow and a yoke of oxen. With these, the farmer had a chance to win a competence and even success. The same laws with slight modifications have been applied in the mountain country, and some of the evil consequences are known. The United States Department of Agriculture has called attention to these conditions, as follows:²

Large areas of the West, more suitable for grazing than for crops, have been sporadically settled to the detriment of the established range industry. . . . Moreover, as the result of the desires of settlers to benefit by the increase of land values, stimulated still more by the activity of agencies striving to effect the sale of land, extension of the land area tends to run ahead of the need for land. The evil results of this tendency are manifold. The enormous losses incurred by settlers in abortive attempts to obtain a foothold on the land and the consequent disappointment and disillusionment are paralleled by the losses of financial agencies engaged directly or indirectly in promoting land settlement. But even more serious is the tendency to lower the average level of profitability for the established farming industry.

One fact is becoming clearer than ever: To invite farmers to enter upon the unappropriated and unreclaimed lands in the intermountain country is no longer any kindness to them. Times beyond number, disaster has come to settlers. As the poorer frontiers are reached, this danger will become steadily greater. But under the homestead laws these lands are open to unrestricted

settlement and they will continue to be dangerously alluring to the immigrating, land-hungry farmer. Should these laws be continued in their present form? If these lands are to be occupied, should they not first be made safe for farmers working them? When a public highway becomes dangerous, it is closed, and danger warnings are posted; yet the nation permits its unappropriated domain to be occupied by settlers, many of whom are wholly ignorant of the hazards against which they must contend.

Yet it is sometimes said that the Homestead Act is of slight importance at this time. On the contrary, from 1900 to 1910 there was a yearly average of 3,800,000 acres entered under these laws; for the 15 years following 1910, the corresponding figure was 6,800,000, and fully three-fourths of this was in intermountain territory.³ This development means more than 10,000 new 640-acre farms each year; in the past 25 years it would be within the truth to say that 140,000,000 acres have been parceled out under this law; this acreage, if put into 640-acre tracts, would mean more than 200,000 farms. Whatever the number may be, whether more or less, these farms are practically all marginal farms at the present price level; even during high war prices, it is difficult to see how farmers would be able to feed and clothe themselves. The "unaware" farmer must be restrained from going to marginal lands which under normal conditions will not support him.

Does it not seem to be an anomalous situation that the Department of the Interior appears eager to get rid of the public domain while at the same time the Department of Agriculture is point-

² L. C. Gray and others, "Utilization of Lands," *Agricultural Yearbook*, 1923, p. 503.

³ *Annual Report of General Land Office*, 1924, p. 38.

ing out the dangers to agriculture of so doing? Does it not seem logical that the General Land Office, so far as agricultural land is concerned, should be under the jurisdiction of the Department of Agriculture?

Instead of a continuously operating homestead law, the intermountain country needs a much more scientifically planned and far-reaching policy of reclamation. In this question many intricate problems are found, some engineering in character, some purely local, some regional, others political, and others affecting agricultural interests in general. It would appear reasonable that a reclamation policy should move forward with caution, without political pressure or favoritism, with the elimination of commercial reclamation projects and with joint state and national aid, this later to be returned by the farms developed. The objective should be to develop on reclaimed lands those conditions which are most favorable to successful farming, and to develop these lands only in response to a definite need for more agricultural products.

There is also the important question of land settlement after reclamation has been made; here, too, a more definite regional policy is needed. This will require the careful selection of farmers to occupy these lands; it should provide for their proper training and direction. This should be recognized as an important and legitimate function of the state and nation. In the case of lands reclaimed through governmental aid of the "revolving fund" type, the exercise of this function may be justified on the ground of protecting heavy investments of public funds. To the farmer operating upon newly reclaimed lands the initial expenses are large, and for a time the risks of farming are very great. Under these circumstances the farmer

needs much expert advice. This applies not merely to methods of cultivating but also to financial and managerial problems.

Very nearly one-third of the nation's area is in the intermountain section. There land of every quality is found. Much of it is not reclaimable for tillage; yet it has native grasses which under experimentation might be developed into forage plants of great value. Considerable portions may be successfully reclaimed, as the Colorado Basin, and also the Columbia Basin with its 1,750,000 acres.

This vast country is all much alike in its geographic and climatic features. It is a region of high average altitude, with hot, cloudless summer days and cold nights, a rainless summer, heavy winter snows, a rainfall much under 30 inches, and weather cycles of bewildering uncertainty. On the whole, a very temperate climate makes it possible to raise cotton both in Arizona and Idaho, and winter vegetables in eastern Washington as well as in southern California. Small-grain cereals thrive, and fruit finds a natural environment.

2. *The Farmers' Tax.* The recent years have made clear the fact that farmers are carrying a big tax load. Taxation is no longer under their control, neither as to policy nor as to the distribution of the tax burden between farm properties and other kinds of property. Their only power is that of protest, and it is a long-distance protest at that. In three eastern Washington counties for the eight years prior to 1920, farm property contributed one-half of the taxable wealth, all other property the other half. But from 1920 to 1924, farm property was valued at 55% of all property while other property dropped to 45%. Here is a definite shift of values and hence a shift

of some portion of the tax, which happened, bear in mind, during the very years when the value of farm property was rapidly falling. If this is true elsewhere over the mountain territory, and there is no reason to suppose that it is not, then a shifted tax is carried by all farmers—a heavy load, unfair and wholly undeserved. A constructive policy for agriculture would include some scientific apportionment of the tax burden between farm property and other property. Clearly, this matter should not be left to the accidents of a wholly unscientific tax system.

3. *High-Cost Farming.* Under present conditions it seems difficult for intermountain farmers to escape high costs of production. This may be inferred from what has already been said. More definitely this handicap results from geographic conditions and a widespread isolation of farmers. Some of the larger items of these costs should be mentioned. If a farmer occupies dry lands under the summer fallow system, his farmstead must be double the ordinary size, for only one-half of the land is cultivated at any one time. Nevertheless, the idle land must be steadily worked to keep down the weeds and to conserve the moisture. Thus both capital and labor costs are increased. If, on the other hand, the farmer has irrigated land, he has made, first of all, a heavy outlay for land and the water rights pertaining to it, which is reflected in heavy interest charges. In addition, water rates rarely fail to be burdensome.

Then there are the high costs of transportation. In part we may attribute these high costs both to the long haul and to the heavy haul over sharp grades. All that the farmer produces must be carried to distant markets, often from 300 to 3,000 miles. There

is scarcely an important intermountain product which does not finally reach markets thousands of miles away. Moreover, almost everything used by the farmer—his clothing, furniture, and household supplies, his machinery, often his building material and his coal—comes to him from distant states, to swell his cost of living and doing business.

A distant market seems to require much expensive marketing machinery, distance greatly adding to its complexity. In the prairie states of the Middle West but few links are needed in the marketing chain. With the far western farmer, more agencies of all sorts appear to be necessary, and hence there are many more possibilities for "masked exploitation." Unnecessary agencies may be created; heavier charges than warranted may be levied; more discriminatory and arbitrary penalties and dockages are found; and an excessive attention may be given to the grading of products. These are all at the farmer's expense. There is no way of escape. Ultimately, he not only bears the risk of market fluctuations, but also his product must support the chain of marketing agencies through to market destinations. Even were these costs reduced to a minimum through cooperation or otherwise, they would still be high compared with those of the Iowa or Illinois farmer. It is hard for widely scattered farmers over an enormous territory to protect their interests in products while in transit to markets thousands of miles distant.

Even hired labor can be obtained only at a high cost. Farmers in these regions must compete for labor with the financially attractive mines and forests and perhaps even then take reluctant, inefficient workers.

It should also be mentioned in this

connection that mountain farmers face not only the usual climatic and market hazards, but also they very generally carry their eggs in one basket. To diversify and thus reduce risks is difficult, although perhaps not impossible. Their situation does not readily yield itself to general farming, as in the Middle West. Dry lands, under present conditions, can be used only for one or a very few purposes, wheat very largely. Corn does not thrive in the West as in Nebraska, because of the colder nights and the greater aridity. Irrigated lands with high values cannot be farmed extensively. They must produce the heavy-yielding crops—such as vegetables and fruits, and hence each farm specializes in some one crop.

These conditions of high costs make a difficult problem for all farmers except those fortunate enough to occupy the better lands. On the best land, production is so prolific and the quality of product so fine that these costs, although high, may easily be borne and yet leave a generous residue of profits. These fortunate ones need not be given any serious attention.

But by far the greater number of farmers occupy lands less desirable than the best. These are the marginal farmers. They undergo the same high costs of production; they run greater risk of crop failure; they occupy the lighter yielding lands; they feel the competition of new lands. These people are the ones to suffer most in periods of low farm prices. Moreover, farmers in this region often fail to prosper, not so much because of their inefficiency but because they operate under adverse conditions not under their control—under a system of agriculture not yet stabilized as to its outside determining factors.

But, it may be asked, why attempt

the cultivation of the poorer, secondary soils? If the forecast made earlier in this paper is correct, the time is not far distant when the entire agricultural output of these lands will be needed by the urban population. Farming here, on all but the best lands, is still an infant industry in its experimental stages. Until this time shall have passed, the whole energy of farmers should go to the details of farming. It is imperative that they study their agricultural environment, seeking to master climatic and soil variations. They must discover those plant and animal forms which are best suited to thrive under the conditions found on the particular land they happen to occupy. Briefly, they are to become scientific experts. It is only through such intensive application that they will be able to reduce their costs of production. But, in the opinion of the writer, this is the work of several generations of farmers and during this time they should be relieved of those vexing problems for which society is largely responsible. If it were possible to secure a relatively satisfactory solution of those outside conditions now so seriously threatening agriculture, and if thereby the farmers were so freed from anxiety that they could give their whole energy to the detection of economies in their business, which they alone can discover, the problem of high costs might be brought more nearly under control—how greatly is a matter of conjecture.

Seaboard population will be in the market for cheap and abundant foods. Very largely, however, these must be drawn from a region which, under present conditions, is characterized by high costs of operation. Are these conditions inevitable and must they therefore continue? The answer to this question, although problematical, would seem to be determined by two factors: (1) Is

it possible to relieve the farmer of those admitted handicaps which contribute to high costs? Let it be assumed that in the years to come the general public should carry to success a policy of agricultural stabilization—an efficient, economical marketing system, a readjusted price level, a tax burden allocated with equity, an amended policy of agricultural expansion, a less burdensome system of transportation. In a word, assume that in these particulars the high costs, and uncertain and speculative elements should give way to a higher degree of order and stability. (2) Let it also be assumed that the farmer for the first time is able to devote his whole thought, as suggested in a preceding paragraph, to the business of reducing his costs.

What would be the total effect of these assumed changes upon the costs of food stuffs? Surely, if the ordinary laws of economics may be trusted to function, the farmer might expect a greatly reduced cost for each pound or bushel produced and, with lower unit costs, greater probability of profits. For seaboard people these same changes in conditions would establish a basis upon which cheap foods might come from the hinterland.

III. A Suggested Policy

Hitherto the agricultural situation of the mountain country has not been segregated from that of the nation. This fact may serve to explain the absence of any specific policy for this region. The West has been content to drift along in the optimistic belief that the future would care for itself. However, the time has come for western peoples to take careful note of present-day tendencies and to interpret these in the light of future needs. It is high time

that they begin to think of policies adequate to those needs. And while the situation is not immediately critical, it is well to remember that policies grow with exasperating slowness and are the result of many years of active, painstaking struggle.

It is not possible to put down in order and to make fully explicit what an adequate policy in agriculture for this region would require. Yet some of the essentials are apparent.

1. In the first place, whatever policy is devised, it should be regional. It must be coextensive with the vast expanse of intermountain territory. Included in this are the nearly 100,000,000 acres of "unimproved" land, singularly uniform in its general geographic features. The situation confronting the farmers of Arizona and New Mexico is essentially not unlike that found in Montana and Idaho. There is no such thing as a local policy. Private community efforts, however praiseworthy they may be, are not adequate to meet nature's handicaps. The combined co-operative efforts of all states in this region are needed to meet in an efficient manner these common problems.

2. Urban coast populations must appreciate in a more immediate way their potential food isolation in the future. This they do not yet understand. Hitherto, good land in coast and tributary mountain country has more than sufficed for the needs of a meager population. Multiply this population, which is only a matter of time, and the present food sources become utterly inadequate. The industrial East is likely to claim all agricultural products east of the Continental Divide and clamor for more. Coast populations must be fed chiefly from their own bread basket, and this may be filled largely from tributary soils—from good lands, of course, but also

from lands now marginal and from those yet to be developed.

3. It must be understood in a yet clearer way that the problems of agriculture here set forth are not agricultural in the narrow sense of farming or tillage of the soil. Rather it is the basic problem of *means, agencies and conditions external in a sense, yet fundamental, to the business of farming* that challenges public attention; in brief, those circumstances over which the farmer as such has no control. From this point of view, there is need for a feeling of more general responsibility to make those conditions such as to insure successful farming. From this standpoint also other industries, commercial and industrial, in coming to the support of a forward-looking program in agriculture, are but laying deep and broad their own foundations in raw materials for factory and shop.

To develop the foregoing, the writer ventures to suggest two working agencies:

1. A Commission on Intermountain Agriculture;
2. A Regional Administrative Agency.

The Permanent Commission on Intermountain Agriculture might be sponsored by the Pacific Coast states but should include representatives of all intermountain territory. This may be a small body of broad-minded, far-seeing men, willing to serve without compensation. Let their function be to cooperate with all agricultural societies; to study intermountain conditions; to suggest policies; to outline projects; to make use of every agency at their disposal, including the scientific departments of the federal government. Their suggested policies might profitably be submitted now and then to a larger body, an intermountain congress. Let this

larger body consider, deliberate, and recommend. In some such manner, through campaigns of education the West may arrive at an agricultural program covering the whole field of intermountain agriculture. Instead of a mass of disconnected, heterogeneous thinking, this agency might promote a larger and more comprehensive program. The whole intermountain country must organize as a region. Why not, then, an "Agricultural Union" for regional needs? Such a union resting upon an awakened and alert public opinion might have great influence in procuring concurrent legislation in each of the mountain states and in Congress.

For the second agency, the suggestion is made that Congress authorize for the intermountain region an Assistant Secretary of Agriculture. Such a functionary, if created, should be a man who knows the West, its agricultural possibilities, its problems—a man of understanding, breadth of view, and good judgment. His official residence might very well be located in the intermountain West.

This official should be authorized to call in a cabinet of unofficial advisers, serving without compensation, men who are familiar with all the economic conditions of the West, agricultural, industrial, and commercial, men who also have breadth of view and practical vision.

The recommendations of this assistant and his advisers should have great weight with the Secretary of Agriculture in Washington, and through him Congress may be reached. In this way the distinctive regional needs of the intermountain region may be segregated from the general needs of the nation. Under present conditions, regional needs do not come clearly into the light.

Such an assistant secretary might very

properly be given a group of administrative duties, subject to the approval of the Secretary of Agriculture. Some of these duties may be mentioned.

1. The administration of the Homestead Act, especially over land destined for agricultural purposes. He should have power to open new lands or to withhold them from entry in accordance with the need for new farms.

2. To him might be entrusted a more exhaustive classification of lands for reclamation than has yet been made; also he might advise as to those conditions and circumstances under which waste lands might or might not be reclaimed. When such lands are reclaimed, he would have the very important duty of finding suitable farmers for the land, and of giving them the necessary advice and direction by which their success may be more nearly assured.

3. He might be charged with such experimental work as would be common for all intermountain territory. This whole region sorely needs a forage plant with the tenacity of sagebrush or bunch grass, capable of cultivation and abundant yield. These states would prosper beyond imagination could such a plant be successfully developed. Many other lines of experimentation beneficial to the West might be opened. One such experimental station would be necessary.

4. Through this functionary the question of marketing, both commercial and cooperative, transportation, and similar problems might be studied from a new point of view and with a new objective.

5. Finally, here is an agency through which might come a better correlation of all the industrial interests of the West. There is, it seems to many, a growing conflict of state interests in that region. Unheeded, this is very likely to become more and more acute, and this would

seriously cripple industrial progress. Under wise leadership this danger may be escaped and the states brought to a willing cooperation for the good of all. Were this possible, it might appear that many a development project might be carried forward by the joint action of these states at common expense. The growing wealth of the West would seem to justify the policy of taking some portion of it for this use. Greater self-reliance would result in less dependence upon the federal government.

The ideas here presented are not intended to segregate the mountain country agriculturally from the Middle West. The aim is to recognize and to handle in the most efficient way the separate and distinctive problems which the mountain region undoubtedly has. The work of the Department of Agriculture is not interfered with. That department is merely given a new mechanism for a specialized piece of work.

The proposal does not extend the much feared idea of paternalism. Aside from the reclamation of land, it builds up no new system of aids, gratuities, or special benefits. On the contrary, it aims to suggest the means to a more comprehensive policy in agriculture, one intended to reach existing needs in a field where private efforts have not functioned and cannot function with success.

In these suggestions there is no attempt to settle any problem which the farmer must meet for himself. Rather, these proposals are directed towards a policy to operate only in those fields where nature and isolation so handicap the farmer that he can no longer function successfully as a tiller of the soil. In short, these ideas, if carried into effect, should do for agriculture what the Federal Reserve Bank in San Francisco is doing for the banking business of the West.

DEPARTMENTS

The departments of the JOURNAL are edited specifically with regard to their interest to the readers who are especially concerned with the economic problems of land and public utilities. For the most part the material for the departments will be prepared by members of the staff of the Institute for Research in Land Economics and Public Utilities.

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BOOK REVIEWS

MacChesney, Nathan William. *THE PRINCIPLES OF REAL ESTATE LAW*. New York: The Macmillan Company, 1927. pp. xlix, 848. \$10.

The Principles of Real Estate Law, by Nathan William MacChesney, which appears in the Land Economics Series edited by Richard T. Ely, makes no pretense of exhausting the whole field of real estate law or of being a reference book for the lawyer who is engaged in the trial of causes. It confines itself to a statement of the general legal principles which underlie land transactions and real estate ownership and possession, and to the documents which lead thereto. To quote the language of the author, "It is an effort of a busy practicing lawyer at the bar who has more or less specialized in the law of real property, to give to the lawyer who has not specialized in that field, to the real estate man, mortgage broker, trustees, or bank officers interested in the loaning of money on real estate, property owners and investors, and to the student of law or real estate, the benefit of some of his experiences."

It is refreshing in that its able and many-sided author writes neither in the language of the medieval legal pundit nor in that of the grade teacher, but with a full appreciation of the fact that the business man and the average business lawyer are neither schoolboys nor pundits but men of maturity and of affairs. He realizes fully that a little learning is a dangerous thing and advises the business man when in doubt to go to the lawyer and the lawyer himself to search the authorities.

The book is not written as a textbook, though it may well be used as a text for

mature students in law schools and schools of commerce, if only it is used by mature and experienced teachers. The sample leases and other legal forms which are reproduced in the book must prove of great value and they evidence the result of a lifelong experience.

General MacChesney gives a lucid statement of the general subject of real property, of real estate transactions, of the nature of estates in land, of the various methods of acquiring title, of the care that should be exercised therein, and of the obligations and duties of the possessor. Though he does not mislead by pretending to discuss fully complicated legal questions and doctrines which, if properly done, would take volumes, he does make it possible for the ordinary business man to understand the general nature of the deeds, leases, mortgages, trust deeds, agency contracts, land contracts, liens, taxes, and other obligations which as a practical man he is called upon to consider. Too often these documents are looked upon merely as things to be signed on the dotted line regardless of consequences.

The work is up to date. Especially valuable are the chapters on long-term leases, cooperative apartments, evidences of and opinions of title, and federal taxation. These subjects are treated with a particularity which, as far as we can learn, is not found in the work of any other writer, and the forms that are given are forms which have been actually tried and tested. Many writers, indeed, have contented themselves with the discussion of adjudicated cases and legal theories. Many have copied standard legal forms and have given them to the public without any real understand-

ing of their import. Many have sought to cover the field in twelve lessons and to present the whole of the intricate subject of real estate law in the form of a few positive definitions and statements. General MacChesney has done none of these things. He has not attempted the impossible. He has covered well what he has attempted. The comments that are made are the result of the faith and experience of the author, and the reason for that faith is clearly stated.

The approach throughout is ethical. Perhaps, rather, it presents the practicality of ethics. The author champions the attempt to elevate the business of real estate dealer and agent into a profession, and he emphasizes the injury to the public and to the owners of property themselves of any other course. He believes in the doctrine of the square deal, both because it is ethical and because it is practical.

In dealing, for instance, with the problem of the ninety-nine year lease, he warns the owner and the agent against piratical documents and sharp practice and overreaching. He is enough of a business man himself to realize that if the lessor is to be benefited, the lessee must be benefited also, and he calls attention to the fact, so often overlooked, that too great a rigidity in the long-term lease will often prevent the lessee from financing his enterprise and thus ruin him and the lessor too.

The work, in short, is written for the realtor and for the lawyer and not for the shyster nor the shark. It is sincere, it is practical, it is ethical, and it is convincing.

ANDREW A. BRUCE.

Snyder, Blake, and Roby, Ralph West. *FUNDAMENTALS IN REAL ESTATE*. New York: Harper and Brothers, 1927. pp. x, 173. \$3.

Fundamentals in Real Estate is a popular theoretical discussion of real estate value plus a short discussion of the real estate market and negotiation. The authors express their point of view in the following words:

The greatest problem of the real estate broker and his client is to judge future values. The nature of the product with which they deal is such that they must give unrelenting attention to what is likely to happen. It is necessary, therefore, to understand thoroughly the forces which give rise to real estate values and the events which cause fluctuations in these values.

With the foregoing in mind they begin the treatise with the theory of value in its broadest aspects applicable to all commodities and services. This theory is orthodox and can be found in most standard texts on economics. It is presented, however, in a very simple, popular style in keeping with the remainder of the work.

After placing the value concept before the reader, the authors explain why real estate is valuable and why values change from time to time. Real estate has certain inherent characteristics which have a continuous effect on its value. While these elements are not peculiar to real estate alone, they are not found to such a marked degree in other fields. These inherent attributes have particular influence on real estate values. They may be summarized as follows: Real estate is an absolute necessity for human activity. It offers relatively great possibilities of substitution and yet is reproducible only within narrow limits. Real estate is a durable and immobile commodity, no two units of which are exactly identical. Relatively large amounts of money are invested in its purchase, and for this and other reasons the average person does not frequently purchase real estate. It is a form of "conspicuous consumption,"

and ownership of real estate carries with it more or less prestige in the community.

Besides these inherent elements there are dynamic characteristics which affect the value of real estate. "By dynamic is meant those elements in real estate values which are constantly subject to modification or change." Inherent elements of real estate are present in every parcel, but not so the dynamic. "Pieces of property vary in their attractiveness because of the presence or absence of these [dynamic] factors, and differences in value may thus be credited to them alone." They are as follows: transportation and location; environment; material composition; size and shape; building restrictions and zoning ordinances; taxation; appreciation; obsolescence; and depreciation.

The discussion of inherent and dynamic characteristics of real estate and their effect on value is followed by an examination of the reasons for fluctuations in the value of real estate in large areas, such as sections of a city or country. The authors point out that migrations are the most important single element. The American populace is a profit-seeking and adventurous people and has practically no reverence for estates and activities built by preceding generations as have the English people, for instance. These characteristics of the people coupled with many other economic considerations (discussed at some length in this treatise) are the principal reasons given for migrations.

The real estate market, as do most markets, depends on the demand and supply of services or goods, but it has in addition many peculiar aspects. The real estate market is mainly local in character. It is relatively unorganized when compared with other commodity markets. Its movements are character-

ized by considerable seasonal activity, by relative slowness in its cyclical trends, and by comparatively small response to rumor and propaganda. Short selling is not practicable in the real estate market, which is also subject to many legal impediments.

The discussion of these aspects of the real estate market is followed by a theoretical examination of the position of real estate markets in the economic structure. "The real estate market is only one of the numerous phenomena which go to make up the economic organization of society." Its position is influenced mainly by distribution of expenditures, distribution of credit, interrelation of expenditures, and insignificance of absolute prices.

The treatise is concluded with a short chapter on negotiation. Real estate transactions are filled with bargaining, higgling, and trading. Most commodities have one price at which they sell, but real estate rarely sells at the asking price. The problem of the broker, then, is to get both buyer and seller to meet somewhere between the price offered and the price asked. This is done by compromise, integration, and domination.

Fundamentals in Real Estate, as a title for this treatise, seems to be somewhat misleading. While everyone will admit that real estate value is fundamental in understanding real estate activity, it is not by any means the only fundamental consideration. The book could hardly be used as a text in a Real Estate Fundamentals course, unless it were used in connection with other works. It would, however, make an excellent part of a larger treatise on urban land economics, or would serve as an introduction to a book on real estate appraisal.

H. O. WALTHER

Pigou, A. C. *INDUSTRIAL FLUCTUATIONS*. London: Macmillan and Company, Limited, 1927. pp. xxii, 397. \$8.50.

Snyder, Carl. *BUSINESS CYCLES AND BUSINESS MEASUREMENTS. STUDIES IN QUANTITATIVE ECONOMICS*. New York: The Macmillan Company, 1927. pp. xviii, 326. \$6.

Hardy, Charles O., and Cox, Garfield V. *FORECASTING BUSINESS CONDITIONS*. New York: The Macmillan Company, 1927. pp. xii, 434. \$4.

The current emphasis upon studies of the business cycle, which these books indicate, proceeds not from the feeling that the problems of the business cycle alone remain unsolved but rather from a growing realization by most economists that control of the business cycle will contribute greatly toward the solution of other problems. That there is ample demand for literature on this subject is evidenced by these three volumes bearing the imprint of the same publishing house. However, each book treats the business cycle in a different way.

The first book differs from the other two in that it is a complete treatise on the business cycle. As stated by Mr. Pigou in his Preface, this book is an elaboration of a part of the first edition of his *Economics of Welfare*, entitled "The Variability of the National Dividend" which was omitted from the subsequent edition. The present volume is divided into two parts. Part I, which embraces nearly two-thirds of the total contents, includes a description and an analysis of the various causes of the business cycle. Part II is devoted to a critical discussion of the remedies applicable toward a solution or mitigation of the business cycle. In both parts considerable space is given to the financial aspects of the problem, but the other aspects are by no means neglected. In many places the arguments and points raised are reenforced with statistical evi-

dence, a method which in one place is characterized by the author as the "combined use of common sense and statistical data." In measuring the business cycle statistically, the chief emphasis is laid upon the unemployment percentages based on returns of British Trade Unions, which makes it appear that the author tries to deduce too much from one statistical series. However, in spite of the use of statistics in various places, a large part of the book is devoted to theoretical discussion to which English economists are so well accustomed. Great attention is given to detail of analysis, and an attempt is made to cover all phases of the problem. Indeed, the author has produced a very scholarly piece of work, which may be considered among the foremost treatises on the subject.

Mr. Snyder's book, as the subtitle states, takes up the business cycle entirely from the statistical point of view. The author is an ardent exponent of the use of quantitative methods in economics, and his book affords proof of this statement. His object is to work out various measures of the business cycle. The first four chapters are preliminary in nature and deal with the business cycle in economic history, the characteristics of economic growth as disclosed by various series, the methods of isolating the business cycle in a given series, and the choice of a base in index numbers of commerce and trade.

In the fifth chapter the author describes in detail his own index number of the total volume of trade, most of which has appeared previously in the *Journal of the American Statistical Association*. It is an index number of the physical volume of trade by months since the beginning of 1919, based on 56 series weighted in accordance with their economic importance. It is designed to

show the general state of business in the country and in this way to furnish a composite picture of the ups and downs of trade. This index number thus serves as a general measure of the business cycle.

The next seven chapters discuss the value of certain individual economic series as measures of the business cycle; among those considered are bank clearings, velocity of bank deposits, business failures, wholesale prices, and interest rates. The last chapter deals briefly with the various methods used in business forecasting, pointing out their limitations. The book is filled with many charts, and in an appendix we find the tables upon which the charts are based. There is also a selected bibliography on business cycles.

Mr. Snyder has a very clear style and omits most of the technical side of the problems considered. His book is a valuable contribution to our knowledge of the business cycle.

Messrs. Hardy and Cox deal with the nature and technique of forecasting the business cycle. They write from the point of view of the business administrator in order to give an understanding of the methods of forecasting the course of his particular business. The first four chapters discuss the general nature of business forecasting, such as the meaning of the term, the characteristics of the business cycle, the underlying assumptions and accompanying methods of forecasting, and a brief description of

the statistical devices used in the process. The next five chapters describe, in so far as information is available, the work of the leading agencies engaged in business forecasting, which are the Babson Statistical Organization, the Brookmire Economic Service, the Harvard University Committee on Economic Research, Moody's Investors Service, and the Standard Statistics Company. This is followed by a chapter giving a brief summary and criticism of the various theories of the business cycle, and in another chapter we find some valuable suggestions for those who desire to engage in the work of forecasting. The remaining chapters describe and appraise, from the standpoint of their value in forecasting, the various economic statistical series, and in each case note is made of the sources containing the data.

One may hardly expect to become an expert forecaster by reading this book, but it contains sufficient material to arouse interest in the subject and some good suggestions to guide one's work. Mr. Hardy and Mr. Cox are especially to be commended for taking a sane attitude toward business forecasting. They dispel the illusion that forecasting in the field of economic phenomena is something mechanical and automatic; on the contrary, it involves making the best possible guess on the basis of all available information. The book should make a very satisfactory text in a college course in business forecasting.

JACOB PERLMAN

BOOK NOTICES

Foster, William Trufant, and Catchings, Waddill. *BUSINESS WITHOUT A BUYER*. Cambridge: Riverside Press, 1927. pp. xvi, 192. \$2.

This latest book by Foster and Catchings is merely a more popular treatment of the subject matter contained in their previous books, *Money and Profits*. *Business without a Buyer* is brief and easy to read. Its first two chapters are introductory; the next two are the most important because they contain the substance of the theory; the remaining six chapters concern themselves with the application of the theory to some of the much discussed problems of the day.

The book contains in its title, *Business without a Buyer*, the main elements of the argument—production without consumption. After drawing their distinctions between general and specific overproduction and after pointing out that money has another function than merely that of a medium of exchange, the authors settle upon overproduction, or underconsumption as they prefer to call it, as the basic cause of our economic ills. Every dollar which the producer takes in profit lessens the amount going to the consumer with which he may purchase the products of industry. Saving, although it is necessary, still further reduces the consumer's income and therefore his purchasing power. Thus underconsumption and the "Dilemma of Thrift" are said to be responsible for our economic troubles.

Perhaps the simplest and most satisfactory method of indicating the substance of the final six chapters is merely to list their headings and subheadings, which are as follows: "Buyers without Money—Can instalment selling keep business prosperous?; How Capital Growth Provides Business with a Buyer—Could prosperity have come without the automobile?; The New Italian Renaissance—How can Mussolini make his people prosper?; Our Foreign Trade—How helpful is a buyer who is not allowed to pay?; Stabilizing the Buyer's Dollar—How is it possible without enough buyers?; and Henry Ford's Policies—Can high wages, low prices, and mass production solve the problem?" The authors have applied their theory only to the problems of industry, commerce, and finance. Agriculture, on the other hand, which in its depres-

sion needs all possible analysis, gets but scant attention in this treatise.

However, *Business without a Buyer*, is a thought-provoking book, particularly useful for testing out in discussion the various theories of profits, the law of supply and demand, the effect of wages and saving on economic activity, and so forth. Some evidence of its success in this use may be found in the fact that 435 essays were submitted to the Pollak Foundation for Economic Research in response to their offer of a prize for the best criticism of the theory presented in *Profits*.

HELEN C. MONCHOW

Laidler, Harry W. *A HISTORY OF SOCIALIST THOUGHT*. Thomas Y. Crowell Co., 1927. pp. xxii, 713. \$3.50.

This book, like the "outlines" of history and the "outlines" of literature and similar works, aims to bring into the compass of one volume a general survey of socialist thought from the prophets of biblical times to the present Russian revolution and postwar movements. The author is aware of the confusion that exists in the minds of people in regard to the many kinds of socialism. He endeavors to show that socialist thought, like economic thought, has undergone evolution. There have been various schools of socialism conditioned by the social and economic environment of a particular period. As these extraneous forces changed, the economic and socialistic thought changed also but every group of thinkers has left its influence on the next. In every period outstanding personalities arose to champion the cause and lead the thinking. These men are given a prominent place in the book. Four chapters are devoted to the situation in modern Russia and the last part treats of allied movements such as consumers' cooperation and Christian socialism.

GEORGE S. WEHRWEIN

Vanderblue, Homer Bews, and Crum, William Leonard. *THE IRON INDUSTRY IN PROSPERITY AND DEPRESSION*. Chicago. A. W. Shaw Company, 1927. pp. xiv, 193. \$7.50.

This book is devoted to an analysis of cyclical fluctuations in the production and

price of pig iron in the United States since 1900. The text is detailed and lucid, and the well-constructed charts and tables form an excellent exhibit of currently available statistics drawn chiefly from the trade journals. The authors make no claim to exhaustive treatment of *all* the available material relating to their subject. The published data on which they base their study make no clear division between the statistics for those companies which keep the metal in molten condition for steel-making purposes and those which sell pig iron in the market. The text, of course, makes this distinction, but it would be desirable to have it carried still further and have the statistics for "steel works," blast furnaces, and "merchant" furnaces segregated, which is not possible from published data.

To understand clearly pig iron statistics or the blast furnace industry, it is essential to keep in mind this distinction between steel works blast furnaces and merchant furnaces. Pig iron capacity is now concentrated in the great steel producing centers, most of the metal being used in molten condition by steel makers. Isolated furnaces are handicapped by increasing competition from steel works furnaces, which can well afford to sell surplus iron from time to time at prices which cut away the profit from merchant makers. Many of the merchant producers have been driven to a new type of integration with by-product coke plant operation, in the effort to spread overhead operating costs and gain stability through independence from the coke market and entrance into the by-product and public utility field. Such a successful marriage between blast furnace and coke plant brings needed operating economies and depends chiefly upon a steady market for gas, although the gas requirements of public utilities may necessitate an overproduction of coke or pig iron when the iron trade is dull. It seems clear, however, that the most secure survivors among merchant producers will be those makers who sell coke oven—and possibly blast furnace—gas and who produce their own coke in conjunction with the manufacture of pig iron.

Perhaps the most interesting chapters are those devoted to regional analysis. The authors bring out clearly the relation between declining, stationary, and expanding producing districts as the blast furnace industry moves westward to enjoy the advantages of lakeside economy and proximity to growing western markets. The declining districts include numerous old furnaces, located inland in the eastern states and producing pig iron directly for the market. Excellent use of the comparative method in regional analysis of the iron industry can well be copied in further studies in other industries.

The price of pig iron appears to forecast steel prices during a decline and, less adequately, during a rise, the lag in the latter case resulting from the persistence of competition among weak producers. The downward trend of prices and the upswing of production since 1900 are explained by improved technique and lower tonnage costs and by increasing large-scale operation and integration, the benefits of which are felt by the consuming industries. Pig iron may be taken as representative of the swings of production and prices in the entire iron and steel industry. Prices are definitely more stable than production since the war.

The most satisfactory forecasters of iron and steel production, the authors find, are scrap prices, net changes in Steel Corporation unfilled orders, and the price of Steel common. Beehive coke production, like scrap prices, is of special value in forecasting, since both beehive coke and scrap are *substituted* respectively for by-product coke and pig iron, therefore reflecting early any prospect of curtailment or expansion. Steel Corporation net earnings continue to be the best ready index of internal stresses in financial structure. In the main, the authors find that steel demand cannot be well predicted except in so far as the statistics of consuming industries show pertinent phases of general business. Automotive demand for steel, however, is well measured, and orders for machine tools are available promptly and usefully.

MEREDITH B. GIVENS.

SUMMARIES OF RESEARCH

COST OF STEAM RAILWAY CAPITAL— FIRST TWO QUARTERS, 1927

THIS summary of the cost of steam railway capital during the first two quarters of 1927 is a continuation of our analysis of steam railway financing from 1920 to June, 1926, which was published in the *Journal of Land and Public Utility Economics* for February, 1927, and the summary for the last six months of 1926 which appeared in the *Journal* for May, 1927. By combining the material appearing in this summary with that in the previous studies the record may be completed through the first two quarters of 1927.

The figures presented in this study indicate that the general downward tendency in the cost of steam railway capital which has continued since 1920 has not yet been completed, although the rate of decrease, as was to have been expected, has fallen off. Although the yield on all securities, at the price received by the company, increased from 5.23% in 1926 to 5.24% in the first quarter of 1927, it fell to 5.16% in the second quarter. This continued fall is more marked in the case of bonds and equipment trust certificates. The yield at the price to the company in the case of the former decreased from 5.34% in 1926 to 5.20% in the first quarter of 1927 and to 5.16% in the second quarter. In the case of equipment trust certificates the yield fell from 4.97% in 1926 to 4.71% in the first quarter of 1927, and increased to 4.74% in the second quarter. The yield on miscellaneous securities at the price received by the company increased markedly over the yields in 1925 and 1926.

The cost of financing, that is, the spread between the price received by the railway company and the offering price to investors, also shows a continued tendency to decrease, more particularly in the second quarter. For the first quarter the cost of financing remained at .20% per dollar per year, the figure for 1926, but in the second quarter it decreased to .15% per dollar per year. This means that the difference between the yield at the price received by the company (5.09%) and that at the offering price to investors (4.94%) averaged .15% for all securities issued during the second quarter of 1927 for which complete data are available. This figure decreased from .52% per dollar per year in 1920 to .24% in 1925. The average cost of financing over the period May, 1920, to December, 1926, was .33% per dollar per year. The decrease in the cost of financing of equipment trust certificates from .24% per dollar per year in 1926 to .11% in the first quarter of 1927 and .13% in the second quarter is particularly noticeable.

The volume of steam railway financing shows an increase for the first two quarters of 1927 over the corresponding quarters of 1926. The total par value of all securities issued during the first quarter of 1926 was \$112,671,500, while for the first quarter of 1927 it was \$168,402,851. In the second quarter of 1926 the total par value of all securities sold was \$134,358,950, while in the corresponding quarter of 1927 it was \$221,747,500. This increase in the par value of securities sold was accompanied

TABLE I. SUMMARY OF COST OF RAILWAY CAPITAL, 1925-1927 *

| | 1925 Year | 1926 Year | 1927 | |
|---|------------------------------|------------------------------|-----------------------------|-----------------------------|
| | | | First Quarter | Second Quarter |
| Yield on securities for which price to company is available: | | | | |
| All securities..... | 171 \$543,476,440 5.44 | 168 \$432,664,311 5.23 | 31 \$168,402,851 5.24 | 41 \$221,747,500 5.16 |
| Bonds..... | 93 358,760,545 5.63 | 71 278,254,600 5.34 | 15 133,178,100 5.20 | 24 212,681,000 5.16 |
| Equipment trust certificates..... | 50 166,717,076 5.06 | 37 126,253,500 4.97 | 4 14,125,000 4.71 | 47 5,685,000 4.74 |
| Miscellaneous..... | 28 17,998,819 5.17 | 60 28,156,211 5.26 | 12 21,099,751 5.81 | 13 3,381,500 5.72 |
| Yield on securities for which both price to company and to investor are available: | | | | |
| All securities..... | 56 422,490,500 5.51 | 52 314,830,000 5.18 | 10 145,533,000 5.21 | 19 199,465,000 5.09 |
| Bonds..... | 28 299,095,500 5.62 | 30 207,147,000 5.29 | 6 135,358,000 5.21 | 15 193,780,000 5.11 |
| Equipment trust certificates..... | 27 122,395,000 5.14 | 21 101,683,000 4.95 | 3 12,675,000 4.71 | 4 5,685,000 4.74 |
| Miscellaneous..... | 1 1,000,000 7.40 | 1 6,000,000 5.40 | 1 7,500,000 6.11 | |
| | 6.20 | 4.86 | 5.37 | |

*On the per dollar basis throughout.

SUMMARIES OF RESEARCH

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| Cost of financing on securities for which both price to company and to investor are available: | | 54 | 49 | 10 | 19 |
|--|--|-------------|-------------|-------------|-------------|
| All securities..... | | 421,601,500 | 312,831,000 | 145,533,000 | 199,465,000 |
| Number of issues†..... | | | | | |
| Par value..... | | | | | |
| Difference in price to company and to investor per hundred..... | | | | | |
| Z\|\|..... |  | 2.61 | 2.22 | 2.72 | 2.54 |
| Z\|\|..... |  | 2.67 | 2.27 | 2.75 | 2.61 |
| Z\|\|..... |  |  |  |  |  |
| Z\|\|..... |  | 2.74 | 2.32 | 2.83 | 2.68 |
| Z\|\|..... |  |  |  |  |  |
| Yield difference..... | | | | | |
| Z\|\|..... |  | .24 | .20 | .20 | .15 |
| Z\|\|..... |  | .27 | .27 | .6 | .15 |
| Number of issues..... | | | | | |
| Par value..... | | 298,295,500 | 205,148,000 | 125,358,000 | 193,780,000 |
| Difference in price to company and to investor per hundred..... | | | | | |
| Z\|\|..... |  | 2.95 | 2.63 | 2.98 | 2.58 |
| Z\|\|..... |  | 3.04 | 2.70 | 3.00 | 2.66 |
| Z\|\|..... |  |  |  |  |  |
| Z\|\|..... |  | 3.14 | 2.77 | 3.10 | 2.74 |
| Z\|\|..... |  |  |  |  |  |
| Yield difference..... | | | | | |
| Z\|\|..... |  | .23 | .17 | .19 | .16 |
| Z\|\|..... |  | .26 | .18 | .3 | .4 |
| Number of issues..... | | | | | |
| Par value..... | | 122,306,000 | 101,683,000 | 12,675,000 | 5,685,000 |
| Difference in price to company and to investor per hundred..... | | | | | |
| Z\|\|..... |  | 1.73 | 1.48 | .67 | .83 |
| Z\|\|..... |  | 1.75 | 1.50 | .68 | .83 |
| Z\|\|..... |  |  |  |  |  |
| Z\|\|..... |  | 1.78 | 1.52 | .68 | .84 |
| Z\|\|..... |  |  |  |  |  |
| Yield difference..... | | | | | |
| Z\|\|..... |  | .30 | .24 | .11 | .13 |
| Z\|\|..... |  | 1 | 1 | 1 | 1 |
| Number of issues..... | | | | | |
| Par value..... | | 1,000,000 | 6,000,000 | 7,500,000 | ..... |
| Difference in price to company and to investor per hundred..... | | | | | |
| Z\|\|..... |  | 4.75 | 1.00 | 2.00 | ..... |
| Z\|\|..... |  | 4.80 | 1.01 | 2.02 | ..... |
| Z\|\|..... |  |  |  |  |  |
| Z\|\|..... |  | 5.04 | 1.02 | 2.06 | ..... |
| Z\|\|..... |  |  |  |  |  |
| Yield difference..... | | | | | |
| Z\|\|..... |  | 1.20 | .54 | .74 | ..... |

†One issue of promissory notes in the second quarter of 1927 was excluded for the reason that it was non-interest-bearing until after maturity.
 ‡All issues sold at a loss to the banker are excluded here. In 1925, two issues, one of bonds with a total par value of \$1,090,000 were sold at a loss.
 §Z = the difference in price to company and to investor, expressed in dollars.
 ¶Z = the total value at offering price, expressed in dollars.
 ¶Z = the difference in price to company and to investor, expressed in dollars.
 N = the total price received by company, expressed in dollars.

by a decrease in the number of issues. Thirty-six issues were offered in the first quarter of 1926, while only 31 were sold in the corresponding quarter of 1927.

In the second quarter of 1926, 51 issues were floated, with only 41 being offered in the second quarter of 1927.

BARCLAY J. SICKLER

PUBLIC UTILITY FINANCING DURING THE SECOND QUARTER OF 1927

THE volume of public utility financing was more than \$200,000,000 less in the second quarter of 1927 than the volume recorded for the first quarter of the current year.¹ During the first three months, securities with a total par value of \$872,071,340 were offered by public utilities, while in the second quarter the total par value of new capital flotations of the utility industries amounted to only \$607,351,715. Reference to Table I shows that, while the volume of financing during the sec-

ond quarter was much lower than that of the first, it was still well above the average volume offered during any single quarter since 1919, and has been exceeded only three times in that period.

This decrease in the volume of public utility financing took place despite an increase in the volume of all corporate financing. The total par value of all corporate financing was \$1,890,056,870 in the first quarter of 1927 and \$1,940,905,067 in the second quarter. Thus the volume of public utility financing amounted to only 31.29% of total corporate financing in the second quarter of 1927, while in the first quarter of the

¹ This analysis is based upon the monthly records of new capital flotations of the *Commercial and Financial Chronicle*.

TABLE I. INDEX NUMBER OF VOLUME OF PUBLIC UTILITY FINANCING, 1919-1927*

| | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 |
|------------------|------|------|------|------|------|------|------|------|-------|
| By Months | | | | | | | | | |
| January..... | 100 | 67 | 55 | 46 | 122 | 112 | 199 | 173 | 259 |
| February..... | 48 | 28 | 25 | 47 | 66 | 89 | 172 | 125 | 314 |
| March..... | 25 | 27 | 25 | 43 | 94 | 78 | 144 | 115 | 158 |
| April..... | 5 | 38 | 25 | 50 | 64 | 112 | 69 | 182 | 165 |
| May..... | 15 | 38 | 35 | 150 | 66 | 233 | 103 | 230 | 214 |
| June..... | 26 | 20 | 9 | 96 | 92 | 122 | 118 | 181 | 130 |
| July..... | 41 | 25 | 115 | 44 | 21 | 104 | 90 | 177 | ..... |
| August..... | 20 | 11 | 33 | 22 | 40 | 62 | 93 | 58 | ..... |
| September..... | 54 | 44 | 34 | 147 | 34 | 77 | 110 | 38 | ..... |
| October..... | 24 | 33 | 33 | 77 | 59 | 112 | 92 | 123 | ..... |
| November..... | 8 | 21 | 119 | 43 | 161 | 69 | 102 | 136 | ..... |
| December..... | 20 | 63 | 53 | 54 | 135 | 111 | 153 | 114 | ..... |
| By Quarters | | | | | | | | | |
| 1st Quarter..... | 100 | 71 | 61 | 80 | 164 | 162 | 299 | 240 | 424 |
| 2nd Quarter..... | 27 | 56 | 41 | 172 | 129 | 271 | 168 | 344 | 295 |
| 3rd Quarter..... | 67 | 47 | 105 | 123 | 55 | 141 | 170 | 159 | ..... |
| 4th Quarter..... | 30 | 68 | 119 | 101 | 206 | 169 | 201 | 217 | ..... |
| By Years..... | 100 | 107 | 145 | 212 | 246 | 330 | 373 | 427 | ..... |

* Volume for January, 1919, First Quarter, 1919, and Year 1919, used as basis for computing index numbers for months, quarters, and years respectively. Compiled from the monthly record of new capital flotations of the *Commercial and Financial Chronicle*.

current year it amounted to 46.13% of the total.

A much larger volume of public utility securities was offered in May than was offered in either of the other two months of the second quarter of 1927 (see Table I). The index number of volume for the month of May (214), although lower than that for January and February, 1927, is still well above the average recorded for a single month. In April and June the amount of financing was smaller, the index numbers for these months being 165 and 130 respectively.

The gas industry slackened the unusually rapid pace of security issues with which it began the current year.² During the first quarter the volume of financing by the gas industry amounted to 23.4% of all public utility financing, while during the year 1926 the gas utility offered only 3.4% of all public utility security issues. The relative importance of the securities of the gas utility, when

measured in terms of volume, was much less in the second quarter. During April, May, and June, securities with a total par value of \$77,815,465, representing 12.8% of all public utility securities on record, were offered by the gas industry.

A drop in the yield to the investor is also noted when comparing the first two quarters of the year (see Table II). In the second quarter all securities of all maturities sold at prices to yield an average return of 5.34% on each dollar and 5.61% on each issue. Corresponding figures for the first quarter of the year are 5.43% on the dollar and 5.71% on the issue. Long-term securities were offered during the second quarter of 1927 at prices to average a yield of 5.34% on the dollar and 5.57% on the issue. The average yield on short-term securities in the second quarter of 1927 was 5.35% on the dollar and 5.84% on the issue. This wide range in the average yield per dollar and per issue on short-term securities is caused by the wide fluctuation in the yields on individual issues. Nine of the 15 short-term

² See "Public Utility Financing During the First Quarter of 1927," *Journal of Land and Public Utility Economics*, August, 1927, p. 331.

TABLE II. WEIGHTED AND SIMPLE AVERAGE YIELD AT OFFERING PRICE OF NEW PUBLIC UTILITY SECURITY ISSUES

| YEAR | ALL TYPES OF SECURITIES | | | | | | BONDS AND NOTES | |
|------------------------|-------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|
| | All Maturities | | Long Term | | Short Term | | | |
| | Weighted Average Yield | Simple Average Yield | Weighted Average Yield | Simple Average Yield | Weighted Average Yield | Simple Average Yield | Weighted Average Yield | Simple Average Yield |
| 1919..... | 6.55 | 6.68 | 6.21 | 6.25 | 6.78 | 7.03 | 6.54 | 6.67 |
| 1920..... | 7.55 | 7.64 | 7.52 | 7.59 | 7.59 | 7.68 | 7.53 | 7.62 |
| 1921..... | 7.13 | 7.47 | 7.11 | 7.42 | 7.27 | 7.66 | 7.11 | 7.45 |
| 1922..... | 6.06 | 6.34 | 6.03 | 6.32 | 6.39 | 6.53 | 6.03 | 6.34 |
| 1923..... | 6.04 | 6.31 | 5.99 | 6.26 | 6.73 | 6.72 | 6.11 | 6.29 |
| 1924..... | 6.03 | 6.14 | 6.04 | 6.16 | 5.97 | 6.04 | 5.98 | 6.12 |
| 1925..... | 5.58 | 5.81 | 5.66 | 5.83 | 5.55 | 5.86 | 5.56 | 5.78 |
| 1926..... | 5.53 | 5.72 | 5.52 | 5.70 | 5.77 | 5.82 | 5.44 | 5.66 |
| 1st Quarter, 1927..... | 5.43 | 5.71 | 5.42 | 5.71 | 5.70 | 5.73 | 5.33 | 5.66 |
| 2nd Quarter..... | 5.34 | 5.61 | 5.34 | 5.57 | 5.35 | 5.84 | 5.17 | 5.58 |
| 3rd Quarter..... | | | | | | | | |
| 4th Quarter..... | | | | | | | | |

issues, representing only 22.3% of the total par value of these issues, sold at prices to yield 6% or more. Of the remaining 6 issues, 3, with a par value of \$25,800,000, representing 70.3% of the total par value, sold at prices to yield

from 5% to 5.17%. *Bonds and notes* only brought a return to the investor of 5.17% on the dollar and 5.58% on the issue. Analogous figures for the first quarter of 1927 were 5.33% and 5.66%.

MARION C. RICHTER

THE SHARE OF AGRICULTURE IN THE NATIONAL INCOME—REVISED AND NEW FIGURES FOR 1925 AND 1926¹

ADDITIONAL data published recently by the United States Department of Agriculture have made it possible to compute final estimates for 1925 and preliminary estimates for 1926 of the net income of agriculture and the share of agriculture in the total "current" income² of the people of the United States.

Table I shows the computation of

¹ See article by same name, *Journal of Land & Public Utility Economics*, May, 1927, pp. 145-162.

² For a definition of "current" income see first footnote to Table II.

the net income of agriculture by crop years from 1919-1920 to 1926-1927, inclusive, with final figures for 1925-1926 and preliminary figures for 1926-1927. It will be seen that the gross income declined from \$13,059,000,000 in 1925-1926 to \$12,471,000,000 in 1926-1927, which is a drop of \$588,000,000. Business expenses dropped only slightly, and as a result the net income decreased from \$9,110,000,000 in 1925-1926 to \$8,588,000,000 in 1926-1927, which is a reduction of \$522,000,000. In each case the decrease was the first one recorded

TABLE I. NET INCOME OF AGRICULTURE, BY CROP YEARS, 1919-1927
(Millions of dollars)

| A | B | C | D | E |
|----------------|---------------|--------------------|------------------------------------|--------------------|
| Crop Year | Gross Income* | Business Expenses† | Taxes on Total Capital Investment‡ | Net Income B-(C+D) |
| 1919-1920..... | 16,098 | 3,306 | 532 | 12,260 |
| 1920-1921..... | 13,049 | 3,689 | 746 | 8,614 |
| 1921-1922..... | 9,597 | 2,448 | 799 | 6,350 |
| 1922-1923..... | 10,750 | 2,501 | 845 | 7,404 |
| 1923-1924..... | 11,674 | 2,760 | 858 | 8,056 |
| 1924-1925..... | 12,391 | 2,865 | 870 | 8,656 |
| 1925-1926..... | 13,059 | 3,053 | 896 | 9,110 |
| 1926-1927..... | 12,471 | 2,987 | 896 | 8,588 |

* Based on estimates of United States Department of Agriculture, *Crops and Markets*, July, 1927, Table 4, p. 252. These estimates include the value of all farm products less the value of products fed, used for seed, and wasted, in terms of weighted average crop-year prices paid to farmers, which gives the value of farm products sold and used as food and fuel by farmers. To these figures were added estimates of the pure rental value of farm dwellings, thus giving the gross income of agriculture.

† Estimates of United States Department of Agriculture, *ibid.*, Table 10, p. 254. These figures cover operating costs.

‡ Furnished by United States Department of Agriculture.

TABLE II. SHARE OF AGRICULTURE IN TOTAL "CURRENT" INCOME OF PEOPLE OF UNITED STATES, BY CALENDAR YEARS, 1909-1926

| A | B | C | D |
|---------------|--|---|---|
| Calendar Year | Total "Current" Income of People of United States* (Millions of dollars) | Net Income of Agriculture (Millions of dollars) | Percentage of Total "Current" Income of People of United States Received by Agriculture (C ÷ B) |
| 1909..... | 27,100 | 5,578† | 20.6 |
| 1910..... | 28,400 | 6,155† | 21.7 |
| 1911..... | 29,000 | 5,856† | 20.2 |
| 1912..... | 30,600 | 6,317† | 20.6 |
| 1913..... | 32,000 | 6,603† | 20.6 |
| 1914..... | 31,600 | 6,771† | 21.4 |
| 1915..... | 32,700 | 7,153† | 21.9 |
| 1916..... | 39,200 | 8,491† | 21.7 |
| 1917..... | 48,500 | 11,451† | 23.6 |
| 1918..... | 56,000 | 13,386† | 23.9 |
| 1919..... | 67,254 | 13,980† | 20.8 |
| 1920..... | 74,158 | 10,549† | 14.2 |
| 1921..... | 62,736 | 6,696‡ | 10.7 |
| 1922..... | 65,567 | 6,975‡ | 10.6 |
| 1923..... | 76,769 | 8,070‡ | 10.5 |
| 1924..... | 79,365 | 8,390‡ | 10.6 |
| 1925..... | 86,461 | 8,890‡ | 10.3 |
| 1926..... | 89,682 | 8,646‡ | 9.6 |

* Estimates of Dr. Willford I. King, of National Bureau of Economic Research, *News-Bulletin*, February 21, 1927, p. 2. The figures for the period from 1922 to 1926 are preliminary. Dr. King defines "current" income as "the excess of cash receipts over business expenses, plus the money value of income received in the form of commodities," which is the same as the definition of the net income of agriculture.

† See *Journal of Land & Public Utility Economics*, May, 1927, Table V, column E, p. 153.

‡ Based on figures in Table I, column E, which have been converted from a crop year to a calendar year basis with the aid of the monthly figures of money income of agriculture from 1919 to 1927, *Crops and Markets*, October, 1926, p. 343, and data furnished by United States Department of Agriculture.

since the lowest point in the depression was reached in 1921-1922.

In Table II, where the net income of agriculture has been converted from a crop year to a calendar year basis, the share of agriculture in the total "current" income of the people of the United States is shown by calendar years from 1909 to 1926, inclusive.

³ The average percentage of the total "current" income of the people of the United States received by agriculture during the six years of the pre-war period, 1909-1914, was 20.9%; during the five years of the war period, 1915-1919, 22.4%; and during the seven years of the after-war period, 1920-1926, 10.9%. During the last six years the average was 10.4%.

From 1925 to 1926, while the total "current" income of the people of the United States increased from \$86,461,000,000 to \$89,682,000,000, a gain of \$3,221,000,000, the net income of agriculture decreased from \$8,890,000,000 to \$8,646,000,000, a drop of \$244,000,000. In the latter case this is the first reduction reported since the lowest point in the depression was reached in 1921. As a result, the share of agriculture dropped from 10.3% in 1925 to 9.6% in 1926,³ which is a reduction of seven points.

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COMMENTS ON LEGISLATION AND COURT DECISIONS

PUBLIC UTILITY LEGISLATION OF 1927

THE regulation of public utilities by a commission to which is granted comprehensive powers has become such an accepted feature of government, in the past 15 years, that a legislative fight to put such a commission out of existence is a significant incident. And when the proposed execution is prevented only through the vigorous efforts, not of the consuming public, but of the utilities regulated by the commission, the episode is doubly interesting.

Just such a situation kept the early days of the Indiana Legislature of 1927 at a white heat of excitement. A bill, sponsored and vigorously supported by large groups of consumers, proposed the abolition of the Public Service Commission, which was bitterly attacked as "the servant and tool of the utility interests."¹ This measure was enthusiastically reported favorably from committee and was finally defeated only by the narrowest margin. Other alternative measures drastically limiting the Commission's jurisdiction also received support but finally failed of passage.

Back of this demonstration against

the Commission there was said to be a series of grievances harbored by the public throughout the state. This dissatisfaction was precipitated by the Commission's approval of the merger of the Indianapolis Light and Heat Company and the Merchants Heat and Light Company and its approval of an issuance of securities by the new corporation. The circumstances surrounding the case, which was pending during the opening days of the legislative session, give not a little support to the charges against the Commission, so violently expressed in the proposed legislation.²

The Illinois Legislature also devoted much of its final weeks to a consideration of important public utility legislation. Bills prepared by counsel for Chicago elevated and street railway interests sought to solve Chicago's transportation tangle by permitting the elevated lines to acquire the street railways and bus systems.³ The city council was to be authorized to grant, instead of the 20-year franchise now prescribed, an indefinite permit.⁴ A transit commission for the City of Chicago was to be

¹ See Associated Press dispatch of January 11, 1927, reporting the hearing of the Indiana Senate Rights and Franchise Committee.

² On December 14, 1926, the applicants for approval of the merger and of the securities to be issued submitted their evidence as to value, and the Commission also heard evidence as to value submitted by its engineers. The protestants were not prepared to proceed with their evidence, and the Commission ordered that the hearings be continued until January 31, 1927, at which time the protestants could cross-examine the applicants' witnesses

and attempt to support their claim that the security issue was far in excess of the value of the property. On January 8, without further notice or opportunity to present evidence by the protestants, the Commission issued its order approving the merger and issuance of \$40,000,000 par value of securities. These facts are derived from accounts in the *Indianapolis News*, particularly the issue of January 8, 1927, Vol. 58, No. 29, pp. 1-2.

³ Senate Bill 439.

⁴ Senate Bill 438.

created.⁵ The bills were caught in the legislative jam, however, and at this writing (October 12) it is uncertain whether a special session will be called during 1927 to consider remedial legislation again.

The special report of the Massachusetts Department of Public Utilities⁶ to the House of Representatives, January 17, 1927, created considerable stir in the Massachusetts session. It will be recalled that Massachusetts has consistently adhered to the prudent investment theory of valuation for rate-making. Since the decision in the Indianapolis Water Company case,⁷ the constitutionality of the Massachusetts practice has been questioned. The Department of Public Utilities advised the legislature that if they were required to apply the reproduction cost theory "we are confident that the people of this state will conclude that the regulation of the rates of the gas and electric companies under such conditions is too cumbersome, inefficient, and expensive to be tolerated."⁸ The Department urged, as an alternative, the enactment of legislation by which a contractual relationship between the companies and the state would be effected, providing a

simpler and more equitable mode of rate fixing.

The jurisdiction of the public service commissions throughout the country continues steadily to be extended. An interesting contrast is afforded by the statute of Washington⁹ which extends the control of the state Commission over a very early form of public utility—the private toll bridge, and the Michigan statute¹⁰ which vests in the Commission the regulation of radio broadcasting originating within the state.¹¹

By other statutes the jurisdiction of the various commissions has been extended over dam and booming corporations,¹² steam boats,¹³ the administration of the Workmen's Compensation Law,¹⁴ the preparation, custody, and publication of the state's official map,¹⁵ and over motor carriers.¹⁶ Changes in the laws governing the procedure or power of the commissions have been few.¹⁷

Students of public utility regulation will watch with interest the fate in the courts of a new Tennessee statute, declaring the gasoline industry "impressed with public use" and subjecting it to comprehensive and detailed regulation.¹⁸

⁵ Senate Bill 440.

⁶ Massachusetts House Doc. No. 1150, dated March 14, 1927.

⁷ *McCardle v. Indianapolis Water Co.*, 47 Sup. Ct. 144 (1926).

⁸ House Doc. No. 1150, p. 7.

⁹ Washington S. L. 1927, ch. 250, p. 391.

¹⁰ Michigan P. A. 1927, No. 131, p. 188.

¹¹ The Commission may prohibit "interference in radio reception caused by the simultaneous broadcasting of two or more radio transmitting stations within the state . . .," and may regulate receiving instruments which cause interference.

¹² Oregon G. L. 1927, ch. 455, p. 695.

¹³ Washington S. L. 1927, ch. 248, p. 382.

¹⁴ Kansas L. 1927, ch. 232, Sec. 33, p. 406.

¹⁵ Montana S. L. 1927, ch. 9, p. 12.

¹⁶ Missouri L. 1927, p. 402; Nebraska L. 1927, ch. 150, p. 403; Texas L. 1927, ch. 270, p. 399. For other extensions of jurisdiction see Oregon G. L. 1927, ch. 454, p. 693; Massachusetts Acts 1927, ch. 316; Massachusetts Resolves 1927, ch. 45.

¹⁷ See Ohio, Senate Bill 238, amending secs. 614-617 of the Code (filing of rate schedules containing sliding scales, etc.); Maryland L. 1927, ch. 335, pp. 605, 607 (rate hearings expedited); *ibid.*, ch. 354, p. 652 (indeterminate orders in rate cases); *ibid.*, ch. 335, p. 605 (suspension or temporary increases in rate cases); *ibid.*, ch. 569, p. 1179 (power to fix maximum rates).

¹⁸ Tennessee P. A. 1927, ch. 22, p. 53. The preamble reads: "Whereas the business of selling and marketing gasoline has become demoralized because of the attempt on the part of some dealers to

We have heretofore discussed in the *Journal* the rapid growth of legislation regulating motor carriers as public utilities.¹⁹ With the enactment during the last session of comprehensive statutes by the states of Missouri and Texas,²⁰ all but three states—Florida, Delaware, and New Mexico—now have state regulation of motor carriers. Nebraska has expressly extended the Railroad Commission's authority over this subject matter, except as to rates,²¹ and in Massachusetts a new provision makes motor carriers' "licenses" to operate indeterminate, that is, effective until revoked by the Department.²² Wyoming has supported its Commission's doubtful construction of the preexisting law by enacting a separate and detailed motor carrier statute.²³

Recent United States Supreme Court decisions²⁴ have led the legislatures of Maryland and Washington to revise their motor carrier laws to avoid imposing common carrier obligations upon private carriers.²⁵ Wyoming seems to

defy the lightning, for Section 1 of its new act embraces vehicles "used in the business of transportation of persons or property by *contract or agreement* for compensation or as a common carrier . . ."²⁶ The Missouri statute also seems dangerously broad, since it includes all "transportation of persons for hire between fixed termini over a regular route" and provides that all such persons "shall be deemed to be a common carrier" and subjected to common carrier obligations.²⁷

In a few states, statutes authorizing the extension of municipal ownership were enacted. The Michigan Legislature authorized (in effect) the City of Detroit to acquire, by purchase, construction, or condemnation, a rapid transit system of subways, surface, or elevated lines,²⁸ and Minnesota authorized cities to acquire freight and passenger terminals for all kinds of carriers.²⁹ An effort was made in Illinois to repeal the exemption from the Commission's jurisdiction of municipally

(Footnote 18 continued from page 435)

monopolize the business and destroy competition, and because of the unfair and improper practices in the trade, it has become necessary for the State to control and regulate the business of selling and marketing gasoline in order to prevent the destruction of competition and to prevent extortionate prices and to preserve both public and private commerce and transportation. It is therefore hereby declared that the sale and marketing of gasoline in this State is impressed with public use." The Federal District Court for the Nashville Division, Middle District of Tennessee, on August 20, enjoined enforcement of the Act as in violation of the Fourteenth Amendment, declaring the sale of gasoline not "affected with a public interest." *Standard Oil Co. of Louisiana v. Hall* (not yet reported).

¹⁹ "Motor Carriers and the State," *Journal of Land and Public Utility Economics*, Vol. 2, p. 257 (1926).

²⁰ Missouri L. 1927, p. 402; Texas L. 1927, ch. 270, p. 390.

²¹ Nebraska L. 1927, ch. 150, p. 403.

²² Massachusetts Acts 1927, ch. 276.

²³ Wyoming S. L. 1927, ch. 98, p. 125.

²⁴ *Michigan Public Utilities Commission v. Duke*, 266 U. S. 570 (1924); *Frost v. Railroad Commission*, 271 U. S. 583 (1926). We have discussed these cases in "Motor Carrier Regulation, Federal, State, and Municipal," 26 *Columbia Law Review*, 954 (1926).

²⁵ Maryland L. 1927, ch. 152, sec. 1, p. 247, provides that "all motor vehicles . . . shall be subject to the provisions of this subtitle, except that the public duties of a common carrier shall not thereby be imposed on the owner of any such vehicle not actually engaged in public transportation." The Washington statute is amended by S. L. 1927, ch. 166, p. 179, by inserting in the definition of the carriers subject to the Act the qualifying phrase, "operating as common carriers."

²⁶ Wyoming S. L. 1927, ch. 98, sec. 1, p. 125.

²⁷ Missouri L. 1927, pp. 402-3.

²⁸ Michigan P. A. 1927, No. 156, p. 251.

²⁹ Minnesota S. L. 1927, ch. 152, p. 238. See also Indiana Acts 1927, ch. 165, p. 476 (water works), and Montana S. L. 1927, ch. 128, p. 410 (natural gas plants).

owned utilities, but the measure failed after determined opposition by the Municipal League.³⁰ The New York legislature authorized cities to act jointly in the construction and operation of water works systems.³¹

Authority for the formation of public corporations for the manufacture or distribution of hydro-electric power is the subject of an extended and detailed Nebraska statute.³² The provision in the statute with reference to rates is noteworthy in the light of recent controversies over the proper basis of rates.³³

The resentment felt by many state commissions and other officials with the virtual disappearance of state control over railroad rates is reflected in a spir-

ited resolution by the Minnesota Legislature, petitioning Congress to restore to the states effective control over intrastate rates.³⁴

The controversy between the proponents of the reproduction cost theory of valuation and those supporting the prudent investment doctrine gave rise to a resolution in the Indiana Legislature which, with other facts, indicates that the valuation question may become the next great politico-economic issue, just as railroad regulation and the money question have been in earlier years. The resolution is so interesting from this standpoint that we reproduce it in the notes.³⁵

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³⁰ Senate Bill 567.

³¹ New York L. 1927, ch. 654.

³² Nebraska L. 1927, ch. 108, p. 296.

³³ Each unit in a hydro-electric district may contract with the district as to rates. It is then provided that "the contract price for electric energy . . . shall be the cost of the same to the hydro-electric district, including interest, depreciation, and renewal, plus a charge for the creation of a sinking fund to cancel the district indebtedness as the same shall be due."

³⁴ Minnesota Resolutions 1927, No. 8, p. 701. See also Minnesota S. L. 1927, ch. 405, p. 555. But cf. Maryland L. 1927, ch. 197, p. 355.

³⁵ "Be it resolved by the General Assembly of the State of Indiana, That the United States senators and congressmen from the several congressional districts of the State of Indiana are hereby respectfully requested to prepare and introduce . . . and secure the enactment of a measure declaring that the basis of all calculations as to rates to be charged

by any public service corporation shall be, as nearly as can be ascertained, the honest and prudent investment in the property at present used and useful for the convenience of the public; and that the rates shall be such as shall provide such public service corporation a reasonable return upon such investment: Provided, always, That the public shall not be required to pay for the services more than they are reasonably worth; and that no such public service corporation shall be entitled to relief under Article 5 or Article 14 of the Amendments of the Constitution of the United States in any court or courts of the United States, wherein such public service corporation complains of and demands relief from any order or judgment fixing or determining any rate or rates, tolls, charges, schedules, joint rate or rates, or valuation, except upon showing that the same has not been fixed and determined in accordance with the provisions of the Federal act so enacted, or such additional or other legislation as shall be calculated to effectuate the object and purpose of this resolution." Indiana Acts 1927, ch. 270, p. 762.

RECLAMATION AND RURAL DEVELOPMENT IN THE SOUTH

IN February, 1927, the United States Department of the Interior transmitted to Congress the report of an investigation into the problem of rec-

lamation and rural development in the South.¹ This investigation was carried

¹ House Document No. 765, Part I, 69th Congress, 2nd Session (1927).

on by the Bureau of Reclamation in pursuance of a special Congressional authorization and appropriation. The actual work and the drafting of the report was in the hands of a committee of three special advisers. They were Howard Elliott, chairman of the Northern Pacific Railway Company, Daniel C. Roper, formerly Commissioner of Internal Revenue, and George Soule, editor of the *New Republic*.

The Committee comes to the conclusion that there is at present an open field for reclamation and colonization work in the South. It does not yet recommend the special steps to be taken in this respect, but wants first more light on the subject by additional investigations. However, the report makes it clear that the advisers favor tentatively the establishment of six group settlements of farmers, one in each of the following states: North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Tennessee.

The Committee discusses at length the general economic conditions of southern agriculture and expresses the belief that the proposed group settlements of farmers might be built up into examples of well-organized farming communities which would be of great educational value for southern agriculture in general and would probably help to a considerable degree in overcoming the frequently slipshod, one-crop methods of cultivation. The advisers have gathered into their report of 38 pages a wealth of material on southern agriculture and modern reclamation and colonization practices which makes their study a valuable contribution to the problem in question.

In spite of this fact, however, the writer of this review has grave objections to the manner in which the report deals with the problem. In its present

form the report is an attempt to prove that a limited number of new farming colonies would be advantageous for the South. But the writer feels the Committee should have dealt with the problem in a more comprehensive manner and formulated the fundamental principles governing reclamation and colonization work in the South.

According to the text of the statute authorizing this investigation, Congress desired to find out how the swamp and cut-over timberlands of the South may best be developed. But the report nowhere contains an answer to this question. It only says that by the establishment of a few experimental colonies part—evidently only an infinitely small part—of the swamp and cut-over timberlands of the South can be developed and that through this colonization work at the same time a general improvement of the southern agricultural industry can be obtained.

These statements may be correct. But they do not cover the field. In fact, they tend to obscure the true situation. The question at issue was whether and how the swamp and cut-over empire of the South might be developed with regard to economic considerations.

It is well known that we have surplus production in some lines of agriculture on the one hand and are threatened with a timber famine on the other. But the Committee apparently neglects to bring these two facts into relation with each other or with the problem of economic utilization of reclaimable or cut-over land. It merely recommends establishing a few farming colonies on some of the cut-over tracts, thereby giving encouragement to chambers of commerce and railway development bureaus who may now say, "Since the report of the Bureau of Reclamation favors settling the cut-over lands, such work must be

'economically sound' and we may therefore go ahead with our settlement activities." Discussing the general aspects of utilization of the southern cut-over lands and declaring them submarginal for agricultural use would have been entirely compatible with the proposal of the report, which is good as far as it goes, to establish a limited number of experimental farm colonies in the South.

But, in the writer's opinion, it would be wrong to establish such colonies on cut-over land. In view of the surplus land resources in the United States, it is evidently advisable to use for agricultural purposes only the best lands, as on them the capital and labor would give the highest returns. But the cut-over tracts are by no means the best lands of the South for agricultural purposes. Most of the cut-over lands consist of light, sandy loam soils which, except for truck farming, are of little agricultural value. The stiffer soils of the Piedmont Plateau and of the Black Soil Belt of Alabama and Mississippi are far better fitted for agricultural purposes and are available for settlement work to an amply sufficient extent. It seems correct, therefore, to establish the new colonies on these better lands. But the report does not consider this difference in the land qualifications, and the result is that five of the six tracts inspected by the advisers on recommendation of the state authorities and tentatively selected as locations of the proposed new colonies are located on sandy loam lands, mostly those of the Coastal Plains. Only in the case of the tract near Selma, Alabama, has the right type of land been chosen, namely, the lime soil of the Black Soil Belt.

Market conditions also prescribe locating the new colonies on good lands of the Piedmont Plateau or the Black Soil Belt. A colony on sandy loam land

will always be tempted to make truck farming the main source of income. But especially for southern truck crops pronounced surplus conditions exist. Every year trainloads of southern products of this kind rot in railway yards of the North or cannot be shipped at all from the farms because no markets are available for them. What the South needs is live-stock farming, especially dairying, outlets being available for these products. However, these types of farming do not belong on the sandy loam land, as the soils of the Piedmont Plateau and the Black Soil Belt are far better fitted for growing grasses and legumes.

Another reason favoring the Piedmont Plateau and the Black Soil Belt is the fact that in these districts the colonization work could be undertaken without creating new farming communities on tracts hitherto unsettled. The essential feature of a modern farm colony is the thorough organization of the whole community. This involves "closer settlement," getting away from the isolation which is in part responsible for the backwardness of many farmers. But this aim can be accomplished also by intensifying the community life in districts which are already partly covered with farms. Any rural district which is partly settled can be gradually built up into a farming community as well organized as a new colony erected on idle land. Such a method seems simpler and less costly than the establishment of a new colony. And above all, this plan would not be subject to the criticism of adding to the area under cultivation in a period when American agriculture is distinctly undergoing a process of contraction and when elimination of land from agricultural use seems to be the great need rather than reclamation of new land.

A further defect of the report seems

to be that it does not discuss the problem of reclamation of the Florida Everglades. The writer believes the Everglades are the only district in the South where reclamation work for agricultural purposes is justified, for this district with its subtropical climate would enter only to a limited extent into competition with the other land resources of the United States, which have almost exclusively a more temperate climate. Or where the Everglades would enter into competition with other lands, they would have considerable advantages justifying their reclamation. The possibilities of growing sugar cane or tropical fruits in this region seem very promising. Development of this swamp area evidently falls within the scope of the Congressional authorization and should therefore have been discussed in the report. At least, mention should have been made of the fact that Florida is at present energetically pushing the reclamation of the Everglades.

It is gratifying to see that a memorandum recently submitted to the Secretary of the Interior by the Bureau of Reclamation² shows that the Bureau has decided to investigate, in addition to the six tracts discussed in the report, a tract west of Fort Lauderdale on the edge of the Everglades.

Another grave defect of the report is that it fails even to mention where the settlers for the new experimental colonies shall be found. The reader is left entirely in the dark whether the advisers want southern farmers or men from the North or possibly immigrants from Europe, although a sufficient supply of suitable settlers is evidently fundamental for the whole colonization work. The writer is well aware that the question of where to get the settlers is a

very complex one. The plans of the Bureau of Reclamation in this respect will be watched with great interest.

The writer's most serious objection to the Committee's report is the neglect of the basic question of public policy. In view of the agricultural overexpansion along certain lines, is it wise to encourage development of the swamp and cut-over areas of the South for crop purposes? Will not such a policy bring new lands and more farmers into competition with the already hard-pressed farmers in other regions? The writer is not unmindful of the sentiment for rejuvenating the South, both industrially and agriculturally. But to give this sentiment overstrained scope is likely to lead to difficulties in the future.

In other sections of the country, timber growing has been urged as an alternative to further agricultural expansion. Why not in the South also? Indeed, the writer believes that the only feasible plan for using the swamps and cut-over lands of the South, under present conditions, is to raise a second crop of timber. The South is losing, if it has not lost already, its lead in timber production. Of our domestic sources only the Far West remains. A timber shortage is at least imminent, while an abundance of some farm products is causing distress.

In short, the Committee would have rendered a great service if it had examined and discussed the merits and defects of a reforestation policy for these lands. It might have paved the way for a systematic forestry policy in the South, which would also benefit the nation as a whole. Certainly it would have enlightened southern opinion about the doubtful value, under existing economic conditions, of bringing more swamp and cut-over lands under the plow.

H. C. KUTHE

² *New Reclamation Era*, August, 1927, pp. 118-119.

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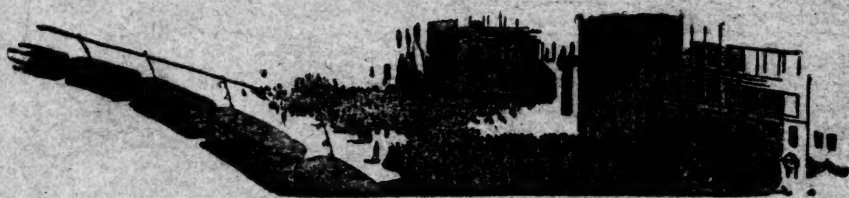
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